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% TRL related to electrification of high performance forestry machinery TRL 6: Technology demonstrated under conditions relevant to the operational environment TRL 7: Prototype demonstrated under actual operational conditions 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 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%

Contact Information

MIDORI Sustainable Food Systems Strategy Division,
Minister's Secretariat,
Ministry of Agriculture, Forestry, and Fisheries
Phone: +81-3-3502-8111 (ext. 3296)
Mail: SCAFFF@maff.go.jp

Published November 2024
Ministry of Agriculture, Forestry, and Fisheries website the MIDORI Strategy
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

MIDORI Strategy for Sustainable Food Systems

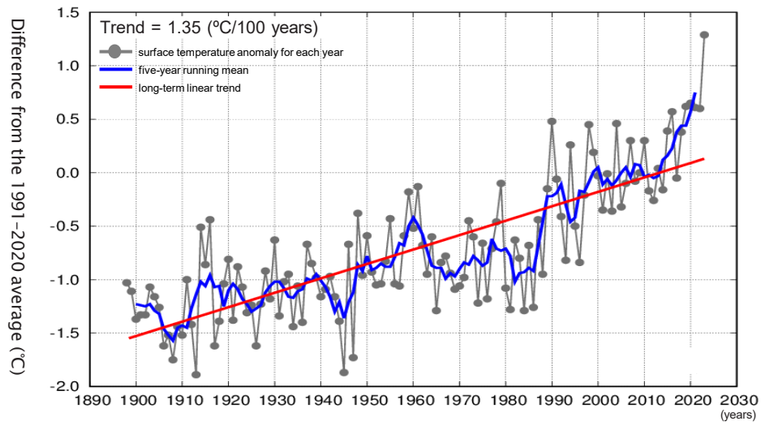
Boosting the Productivity Potential and Sustainability in the Agriculture, Forestry, Fisheries and Food Industries with Innovation.

MAFF
Ministry of Agriculture, Forestry and Fisheries

Food Systems Challenge

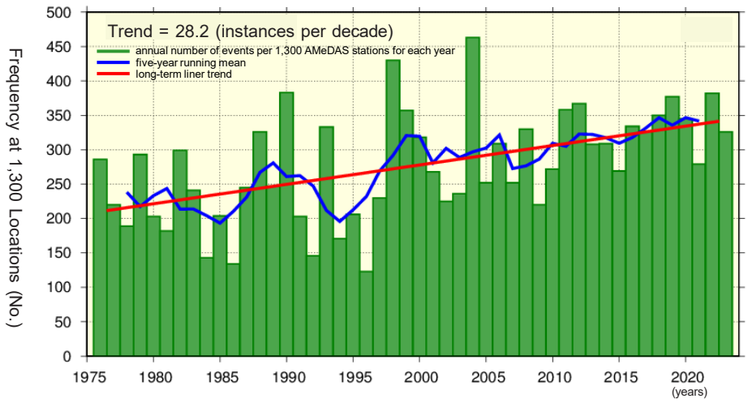
Heavy precipitations, frequent typhoons, and rising average temperatures have become one of the gravest risks facing the food systems in Japan. They have major impacts on production sites such as reduction and quality degradation of harvests, and decline in fish catches.

■ **Change in the Average Annual Temperature Deviation in Japan**



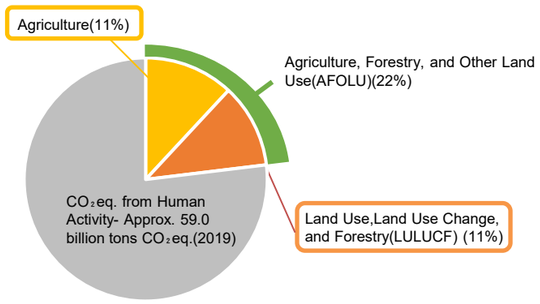
Source: Japan Meteorological Agency website

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



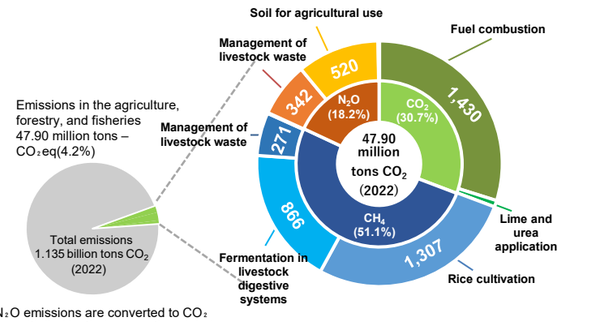
Source: Japan Meteorological Agency website

■ **Global Greenhouse Gas Emissions from AFOLU**



Source: Climate Change 2022: Mitigation of Climate Change.
Working Group III Contribution to the IPCC Sixth Assessment Report

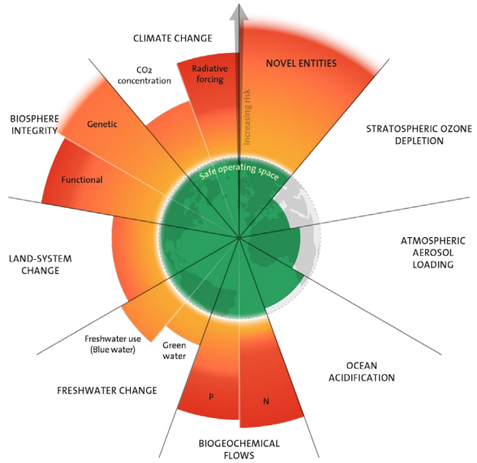
■ **Greenhouse Gas Emissions in the Agriculture, Forestry, and Fisheries in Japan**



CH_4 and N_2O emissions are converted to CO_2 equivalents multiplied by their respective global warming potential(GWP: 28 for CH_4 and 265 for N_2O).

Unit: 10 thousand tons CO_2 equivalent
Source: Greenhouse Gas Inventory Office of Japan (GIO), National Institute for Environmental Studies

Toward the Sustainability Goals



Source: "Azote for Stockholm Resilience Centre, based on analysis in Richardson et al 2023".

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 website

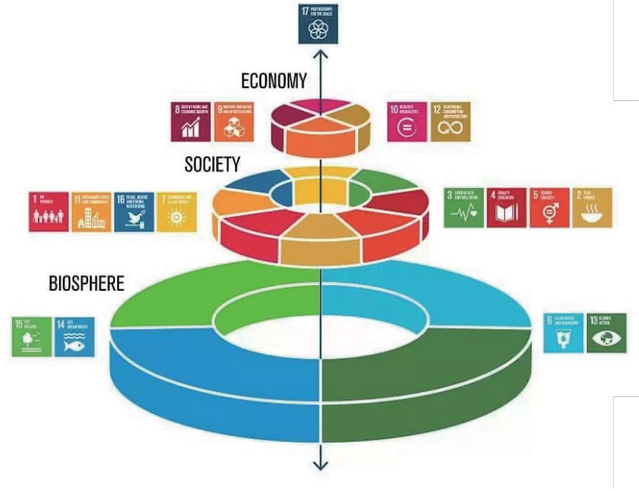
The green zone in this picture is the safe operating space, and the red is a high-risk zone. Six of the nine boundaries (climate change, biosphere integrity, land-system change, freshwater change, biogeochemical flows and novel entities) are already in the high-risk zone.

SDGs Wedding Cake

SDGs wedding cake shows 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.

MIDORI Strategy for Sustainable Food Systems

~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

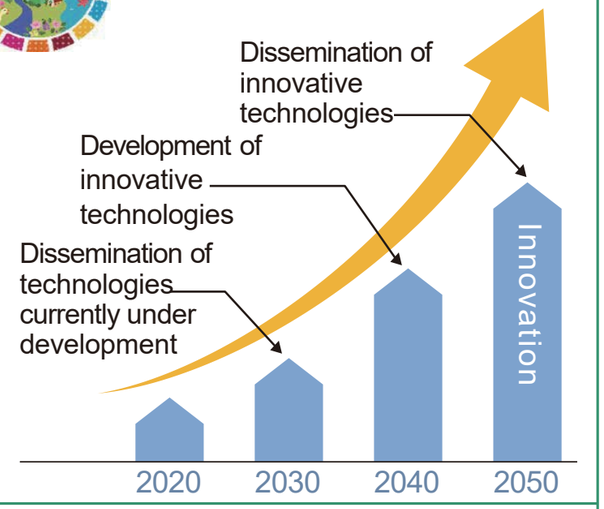
Challenges

- 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 CO2 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

MIDORI Act

- The "MIDORI Act" was entered into force in 2022 to implement the MIDORI Strategy
- It gives incentives for producers to introduce environmentally-friendly technologies, such as ag-machineries and facilities while approaching stakeholders to shift their behaviors
- As of July 2024, over 17,000 producers legally certified based on the Act
- Benefits of certified producers are tax-credits, financial supports and simplified administrative procedures

Purpose of the Act: Realization of the MIDORI Strategy for sustainable food systems ⇒ Sustainable development of agriculture, forestry, fisheries and food industry / Ensuring stable food supply

Philosophy of the MIDORI Strategy

- Cooperation of producers, businesses, and consumers
- Development and utilization of technology
- Smooth food distribution

Clarification of the roles of stakeholders

- Responsibilities of the national and local governments (formulation and implementation of policies)
- Efforts by producers/businesses and consumers

Measures to be taken by the government

- Promotion of understanding among stakeholders
- Promotion of inputs, production, processing/distribution and consumption that contribute to reducing environmental burden
- Promotion of technology development and dissemination
- Visualization of environmental burden reduction efforts

Basic Policy (National Level)

Consultation / Agreement

Basic Plan (Prefectural/Municipal Level)

Application / Certification

Producers working to reduce environmental burden

Application / Certification

Businesses providing new technologies, etc.

Radio-controlled mowers which can be used on steep slopes

Pinpoint pesticide application using drone

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
- Only for rice, biodiversity conservation efforts can be evaluated according to the total score of farming practices as an additional indicator

GHG emission reduction[*1]

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

*1: For rice, vegetables, fruits, tea (23 crops)

Biodiversity conservation[*2]

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

*2: For rice only

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

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

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

Potato

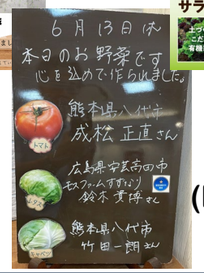
Cabbage

Rice

Food services

Onigiri (Rice ball)

Lettuce (Salad)



Lettuce (Hamburger)

Carbon Credit Scheme

➢ Japanese credit scheme(J-credit) provides incentives for farming methods which reduce/removal GHG emissions

Examples of J-Credit Methodologies

Biochar application

Credits for **the amount of biochar applied on the farm**. Farmers can easily obtain credits by registering the amount of applied biochar.

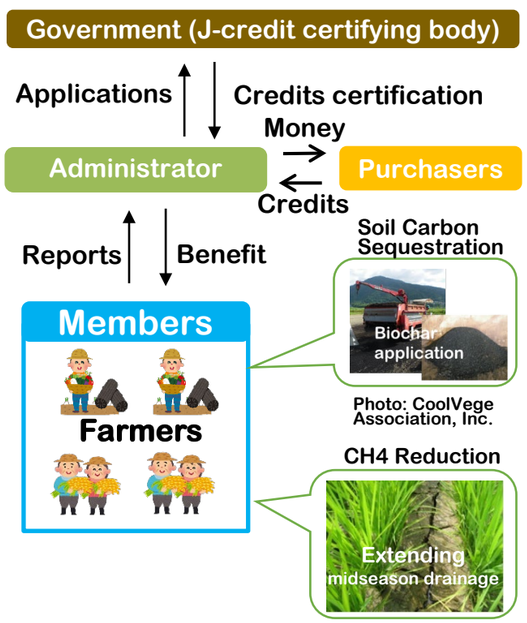
Prolonging midseason drainage

Credits for **the amount of methane reduced by extending midseason drainage in paddy fields**, which can reduce methane emissions from paddy fields by 30%.

Amino acid balanced feed

Credits for **the amount of N2O reduced by using this feed**. They are an incentive to promote a multi-stakeholder circular economy.

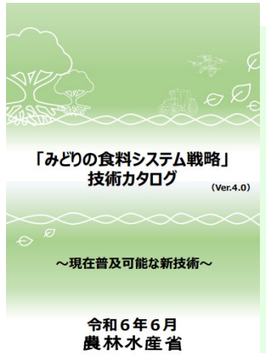
Model Case of J-Credit

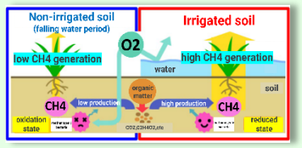


Enhancing Global Sustainability in the MIDORI Way

➢ Improve sustainability of agriculture through dissemination of innovative technologies

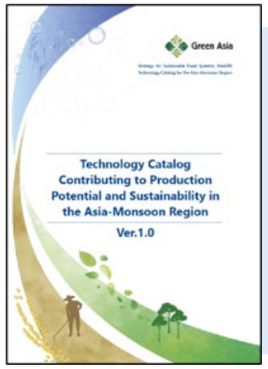
MIDORI Strategy Technology Catalog for Japan

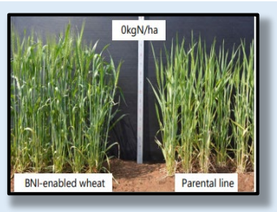




Water management of paddy field for reducing GHG emission

Technology Catalog for Asia-Monsoon Region





BNI enables a 60% reduction in fertilizer use

ASEAN-Japan MIDORI Cooperation Plan (Approved on Oct 4th 2023)

- Building Resilient and Sustainable Agriculture and Food Systems in the ASEAN Region Based on the MIDORI Strategy -

Characteristics of Asia-Monsoon Region Agriculture

・Hot and humid
・Paddy field farming
・High proportion of small farmers

Asian countries' own best-fit solutions standards method for mitigation

No "One size fits all" Solution

ASEAN-Japan MIDORI Cooperation Plan

- Japan's experiences: **INNOVATION** through R&D, human resources development and other policy measures
→ Based on Japan's experiences, each country selects the most appropriate technical cooperation
→ Building resilient and sustainable agriculture and food systems

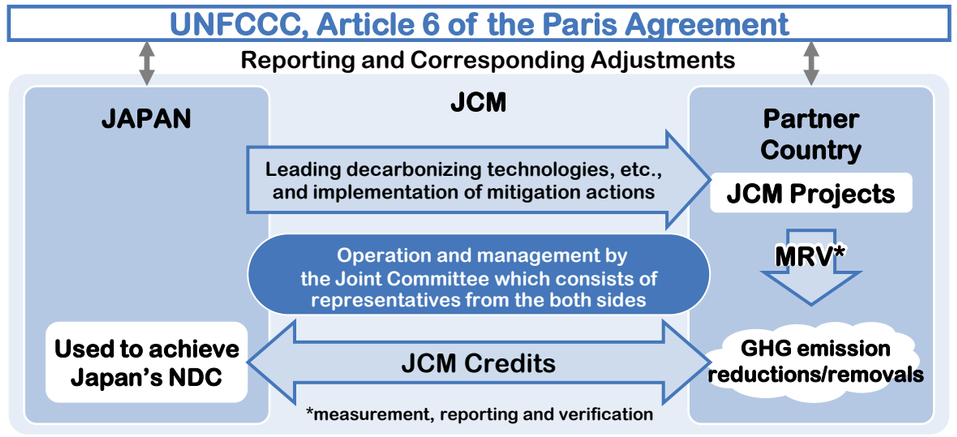
- Contribute to food security and sustainability in the ASEAN region
- Disseminate to the world as an initiative of the Asia-Monsoon region

Basic Concept of the Joint Crediting Mechanism (JCM)

➢ Facilitate diffusion of leading decarbonizing technologies and infrastructure, etc., through investment by Japanese entities, thereby contributing to GHG emission reductions or removals and sustainable development in partner countries.

➢ Contribute to the achievement of both countries' NDCs while ensuring the avoidance of double counting through corresponding adjustments.

➢ Implement the JCM consistent with the guidance on cooperative approaches, referred to in Article 6, paragraph 2 of the Paris Agreement.



Government of Japan, 2023, "Recent Developments of The Joint Crediting Mechanism (JCM)"