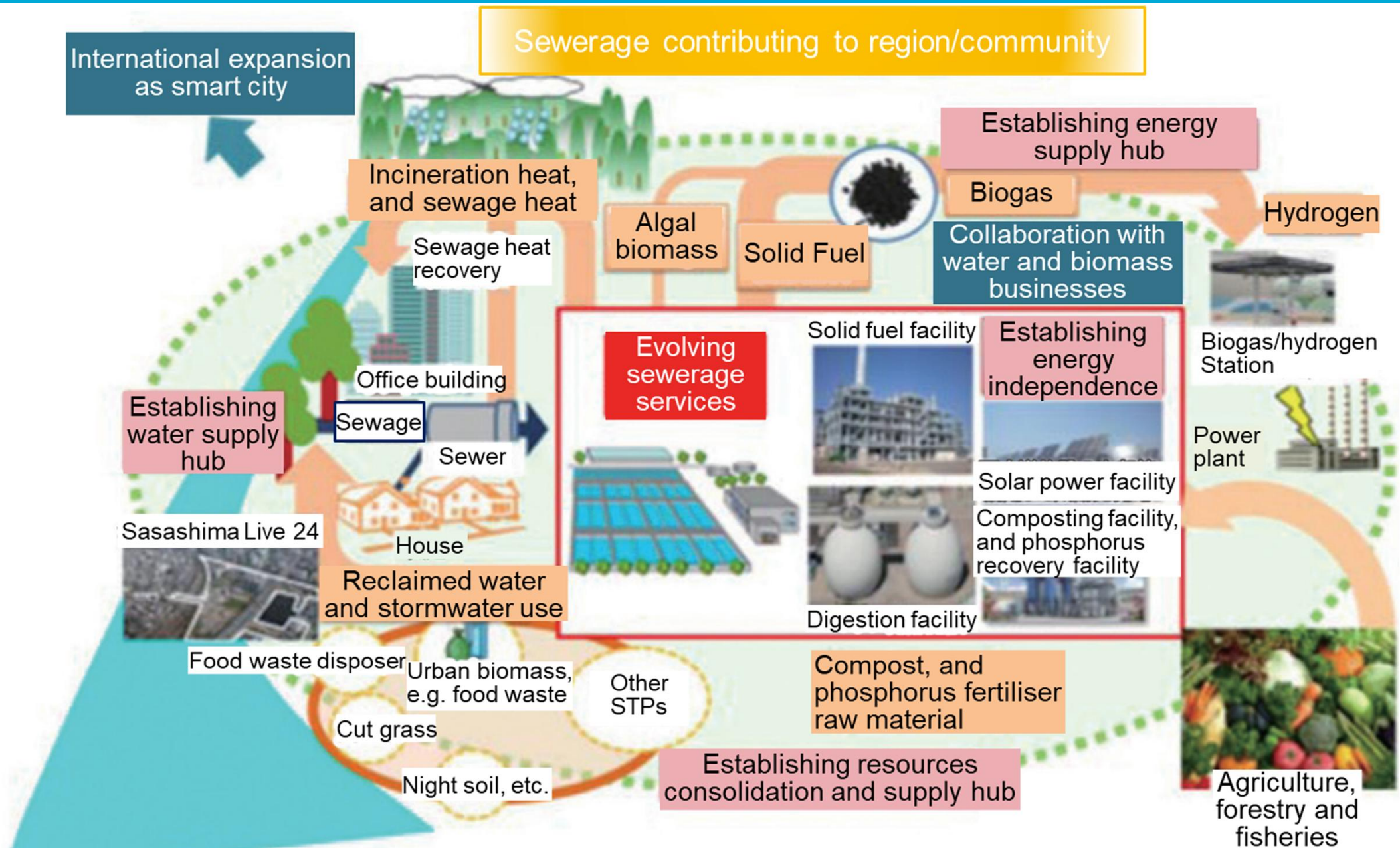


Towards Maximising Agricultural Use of Sewage Sludge in Japan

Toshiaki Yoshida

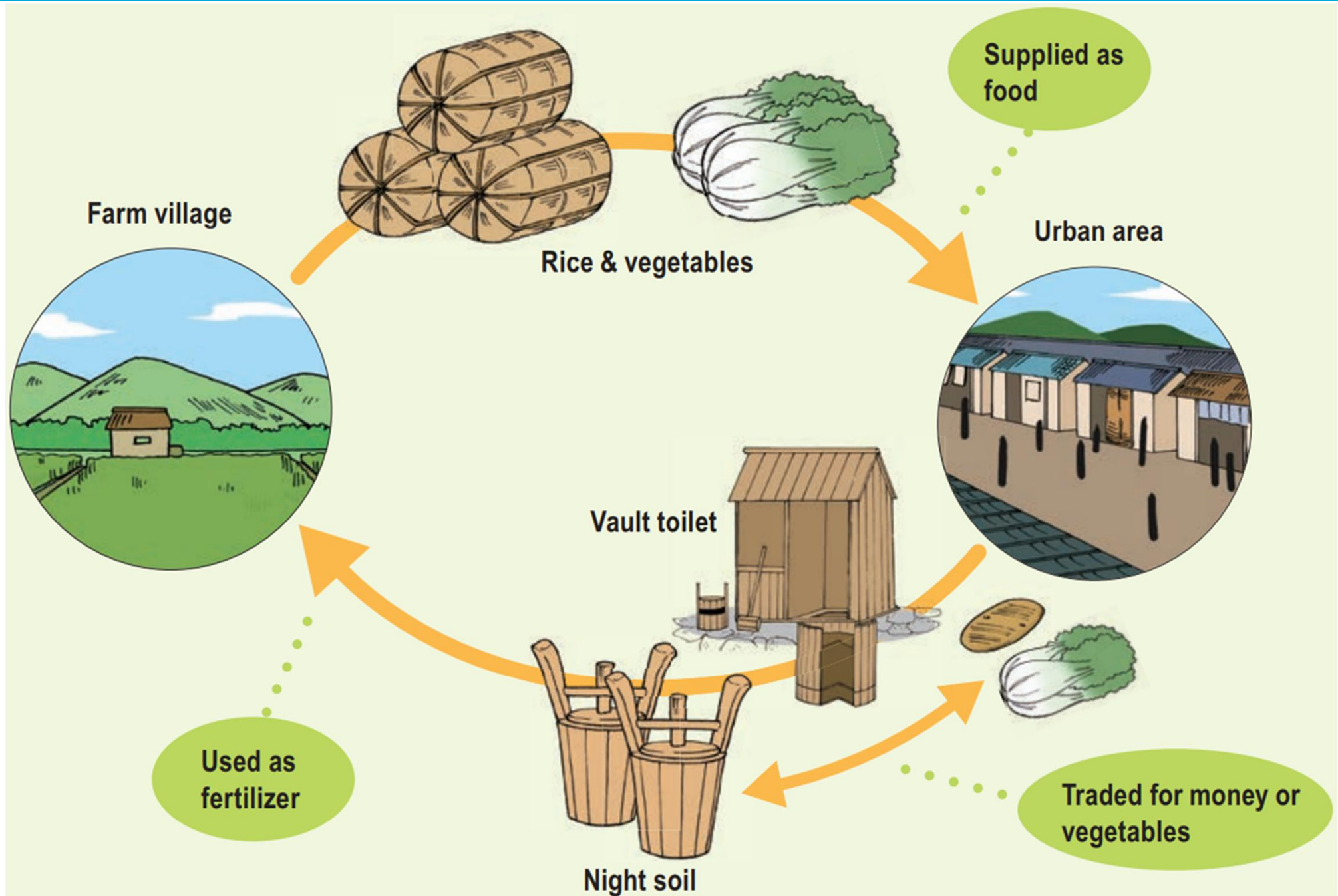
Director, Decarbonization and Resource Recycling Office,
Water Supply and Sewerage Planning Division,
Water and Disaster Management Bureau,
Ministry of Land, Infrastructure, Transport and Tourism,
Government of Japan

Establishment of Water/Resources/Energy Consolidation/Independence/Supply Hub



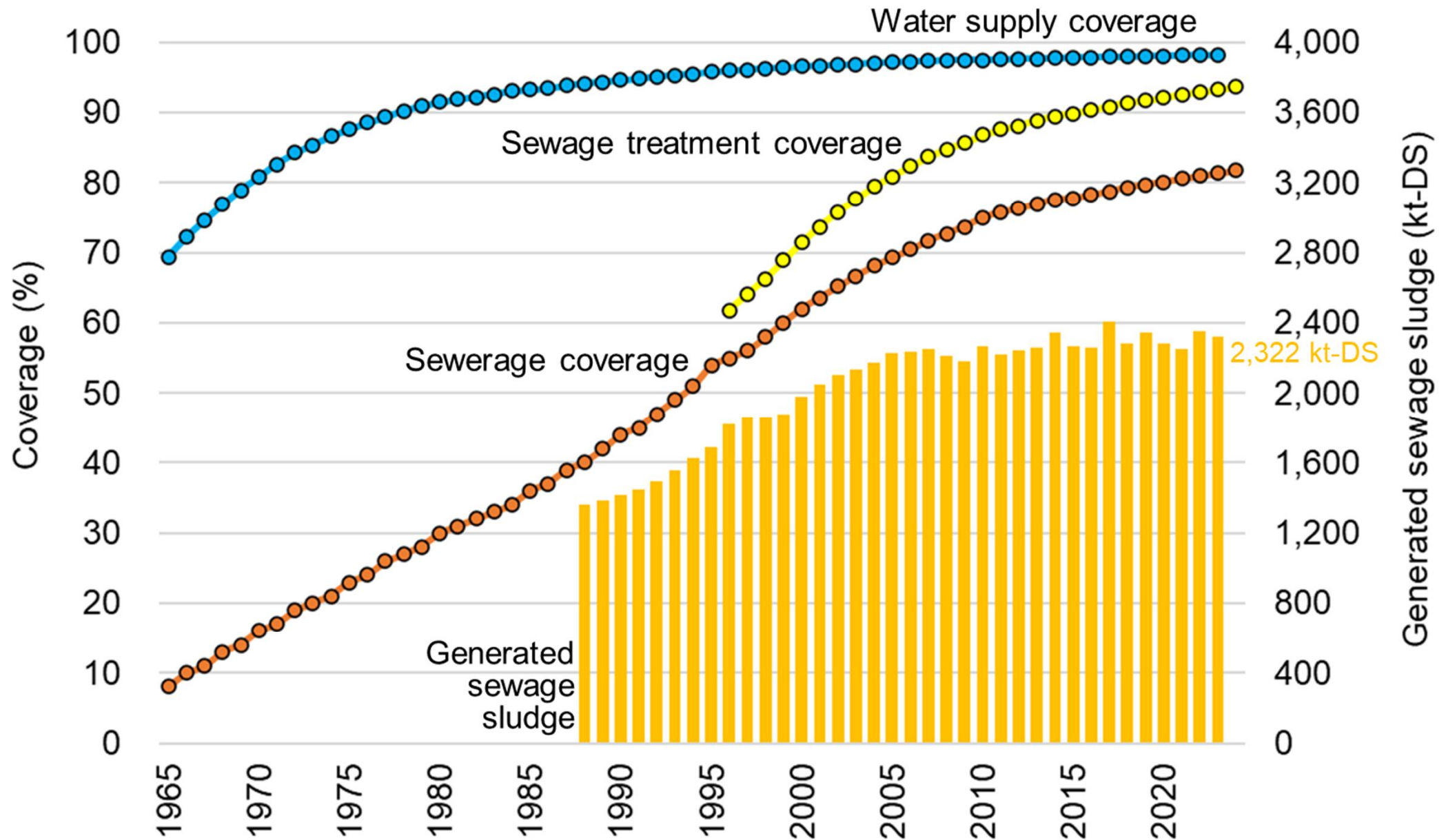
Source. "New Sewerage Vision" Ministry of Land, Infrastructure, Transport and Tourism, Government of Japan, and Japan Sewage Works Association, July 2017

Night Soil Recycling Systems in the Edo Era (1603-1868)

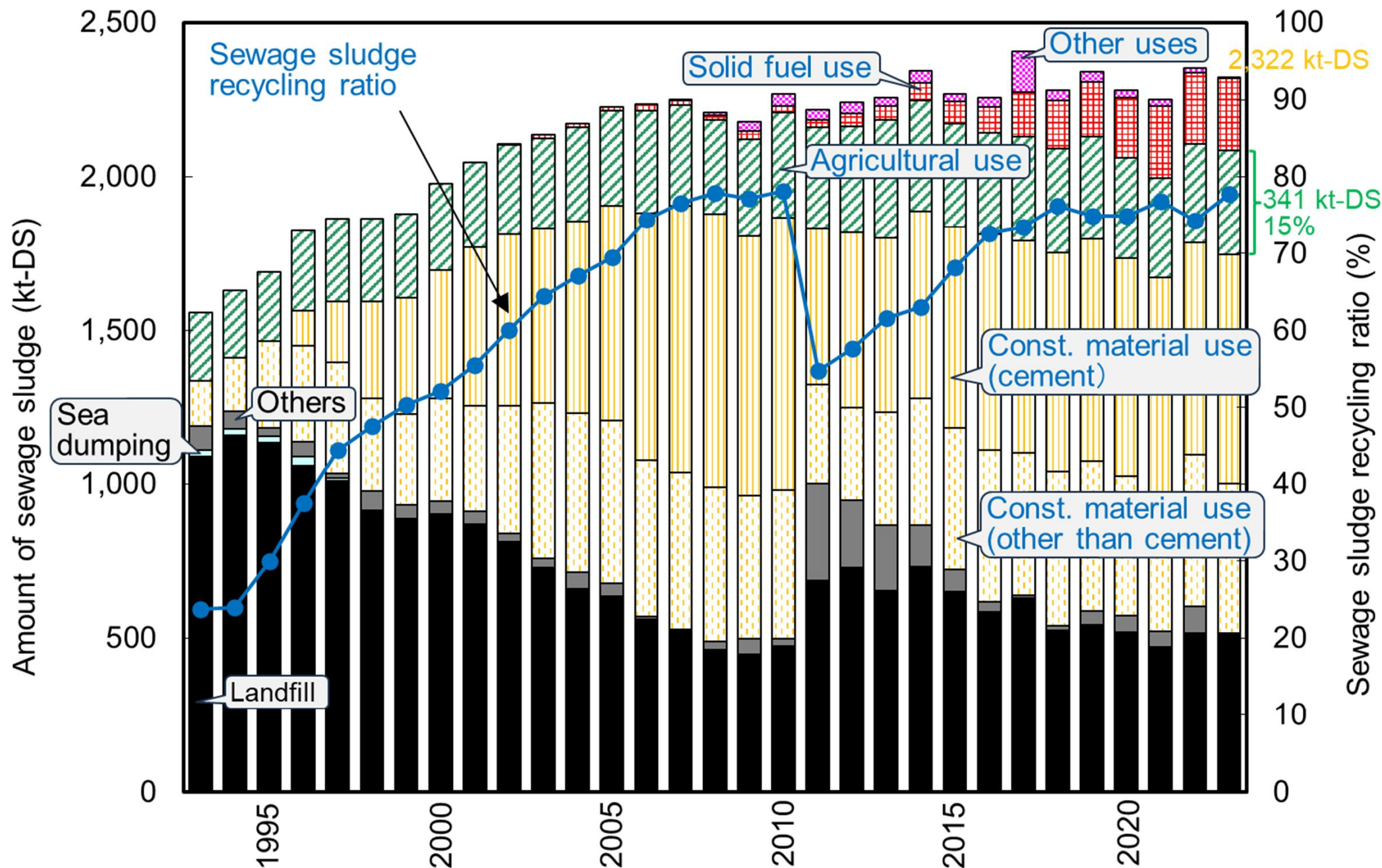


Source. "Night Soil Treatment and Decentralized Wastewater Treatment Systems in Japan" Ministry of the Environment, Government of Japan

Trend of Sewerage Coverage

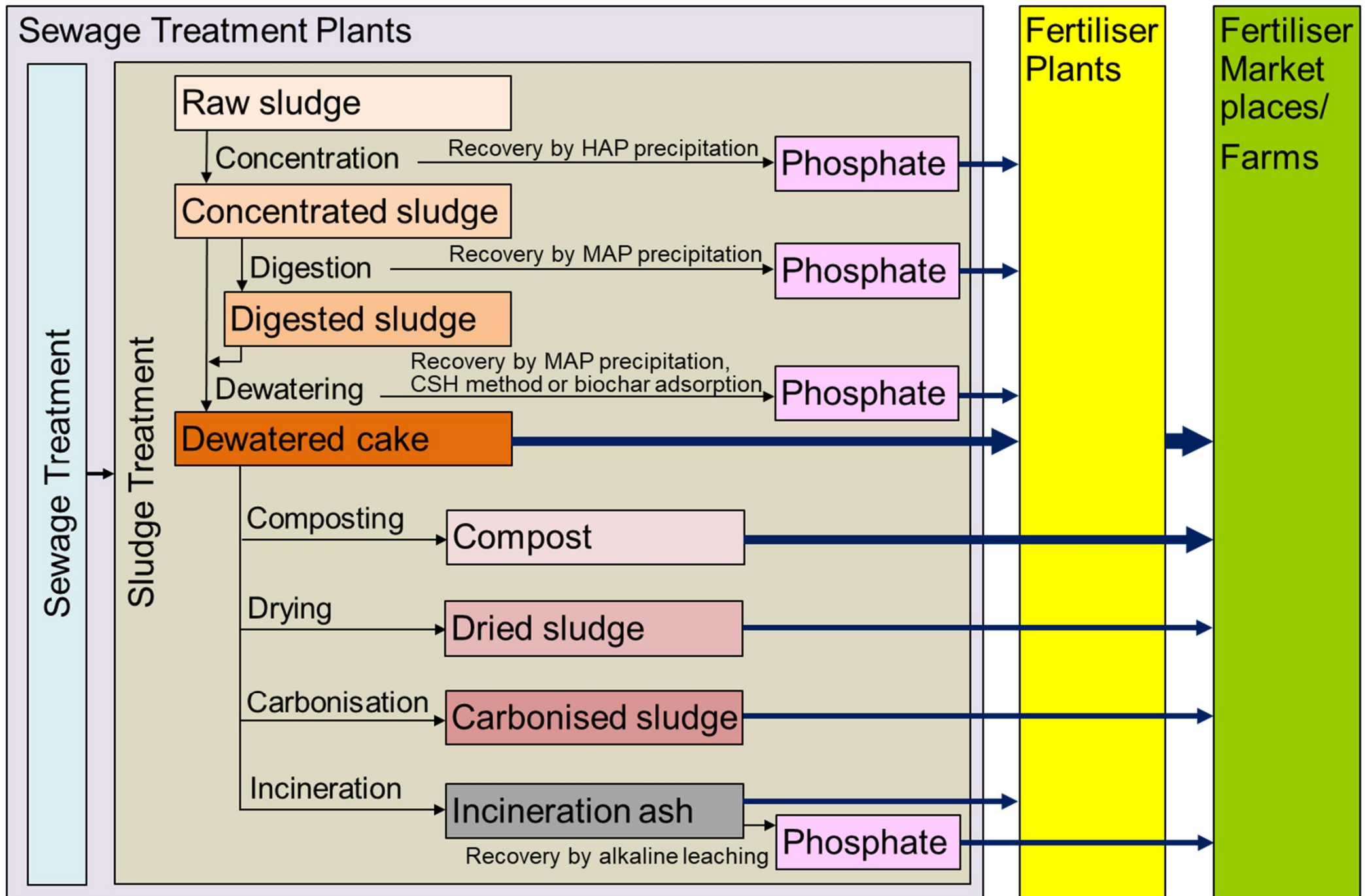


Trend of Sewage Sludge Recycling



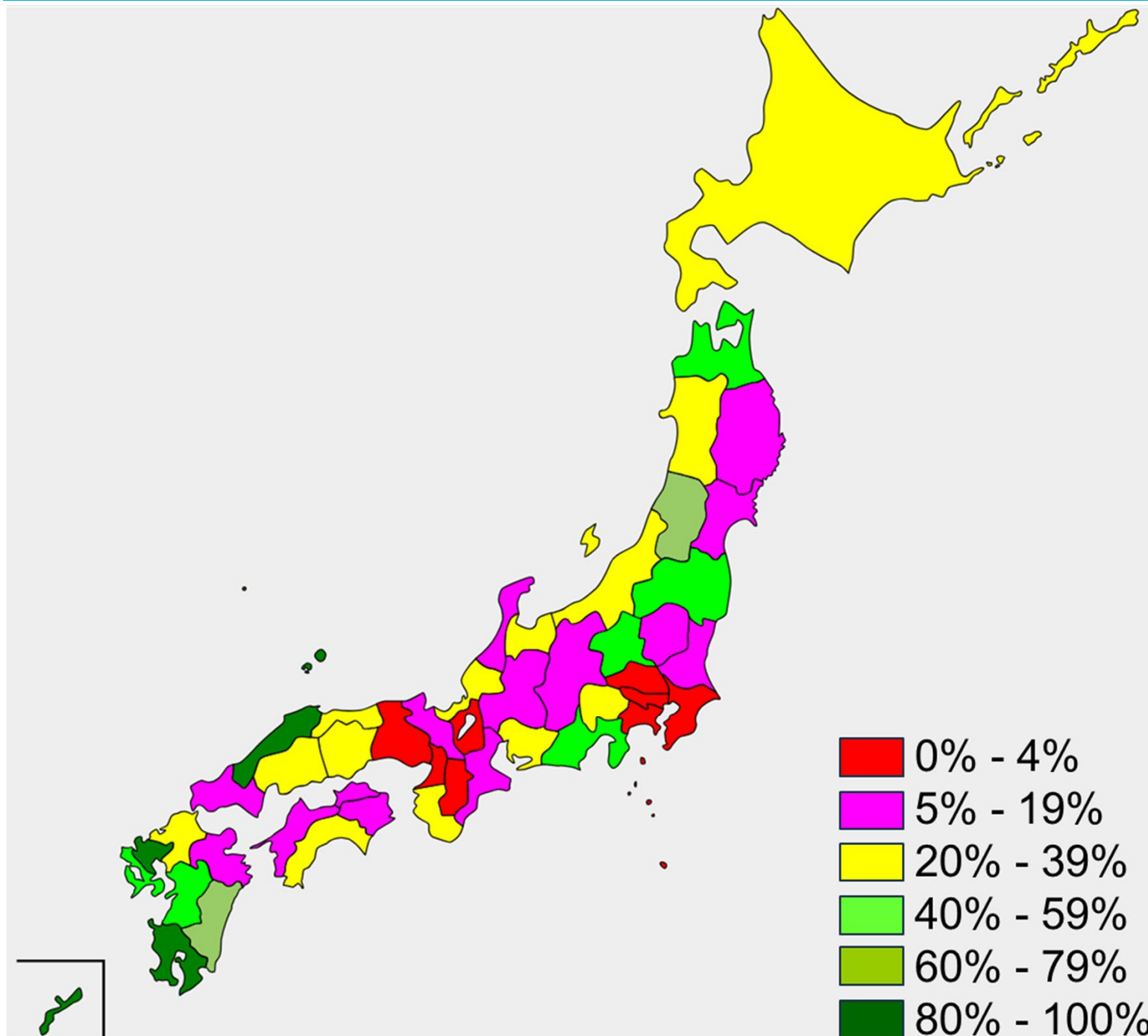
Note. Digestion gas use is not included.

Various Types of Sewage Sludge Agricultural Uses



Sewage Sludge Agricultural Use Ratio by Prefecture

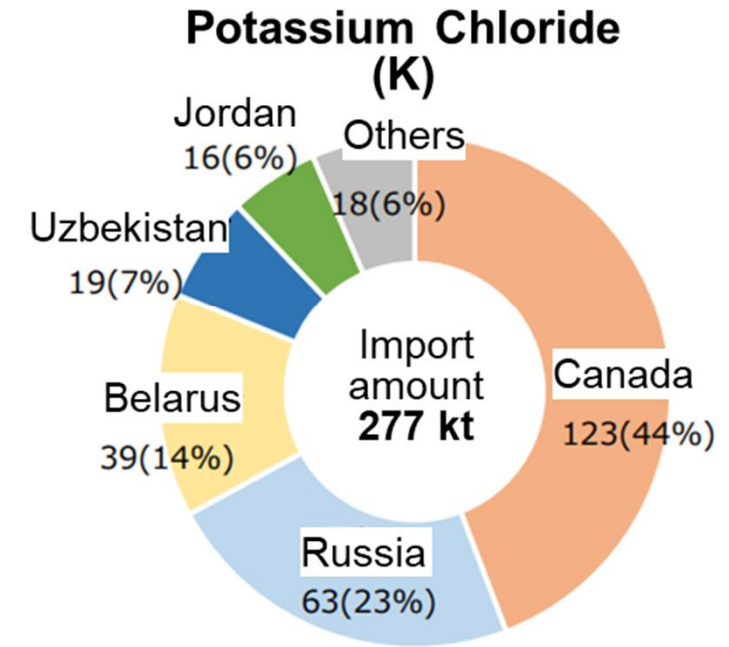
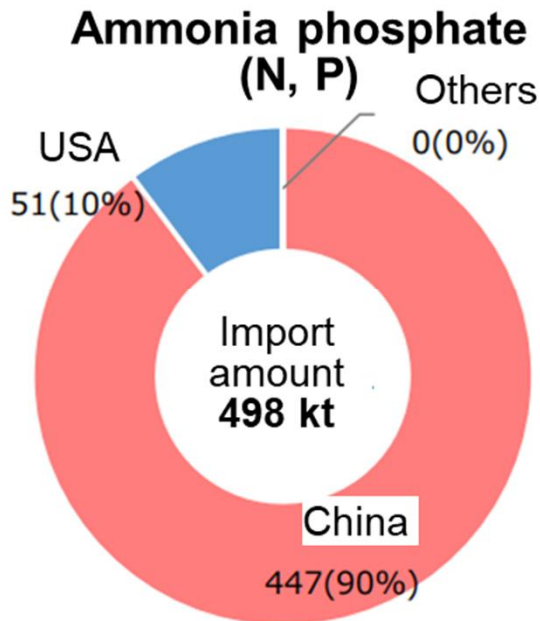
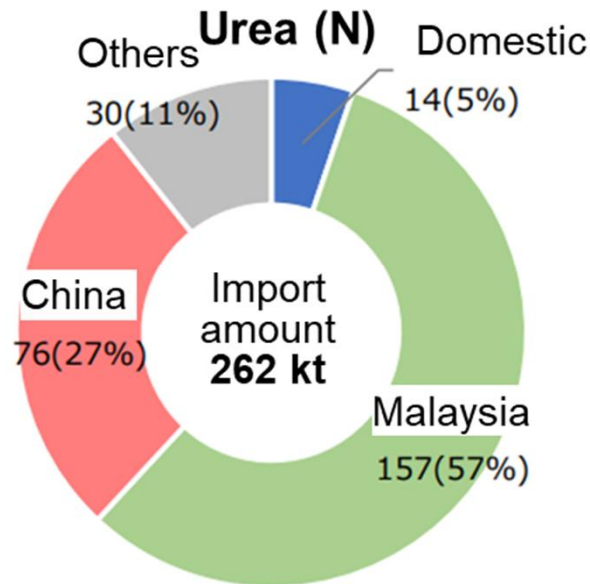
Data in FY 2023



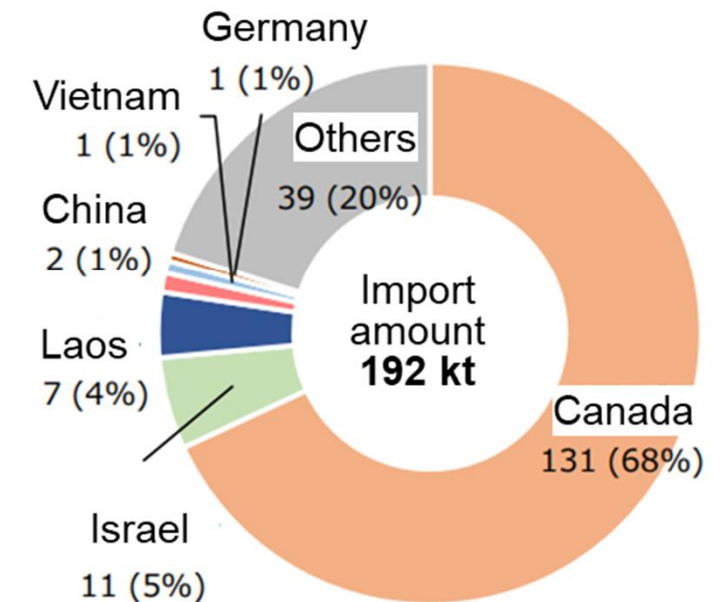
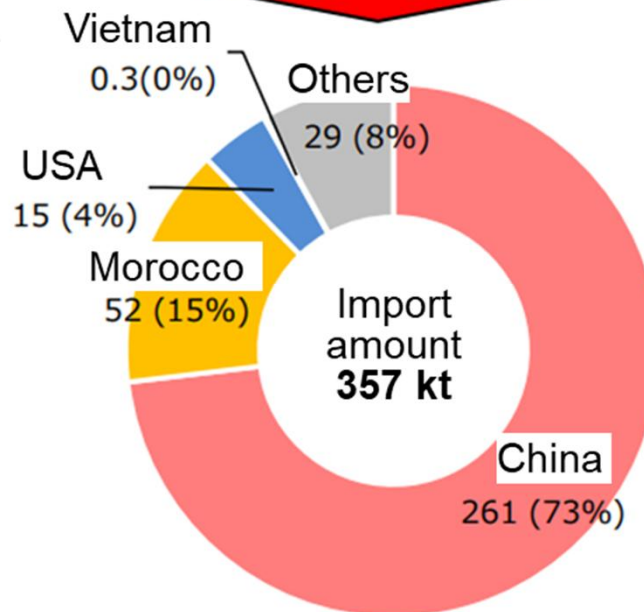
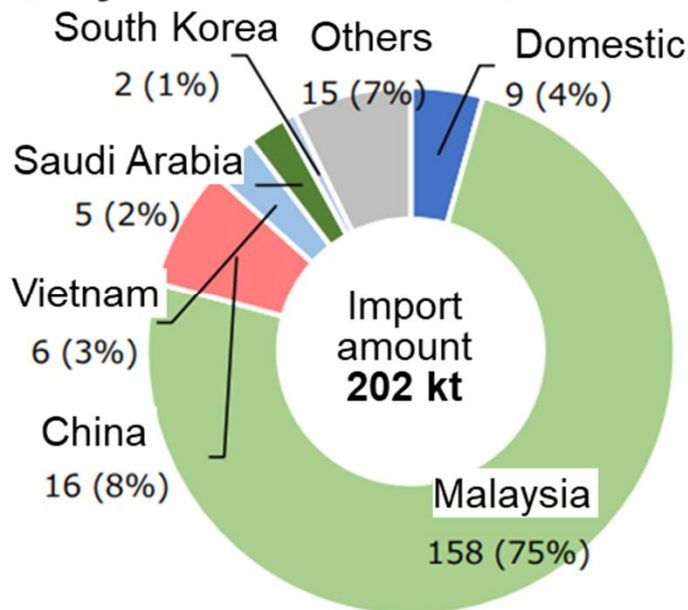
National average
(47 Prefectures)
15%

Import Partner and Amount of Chemical Fertiliser Raw Materials

July 2020 - June 2021

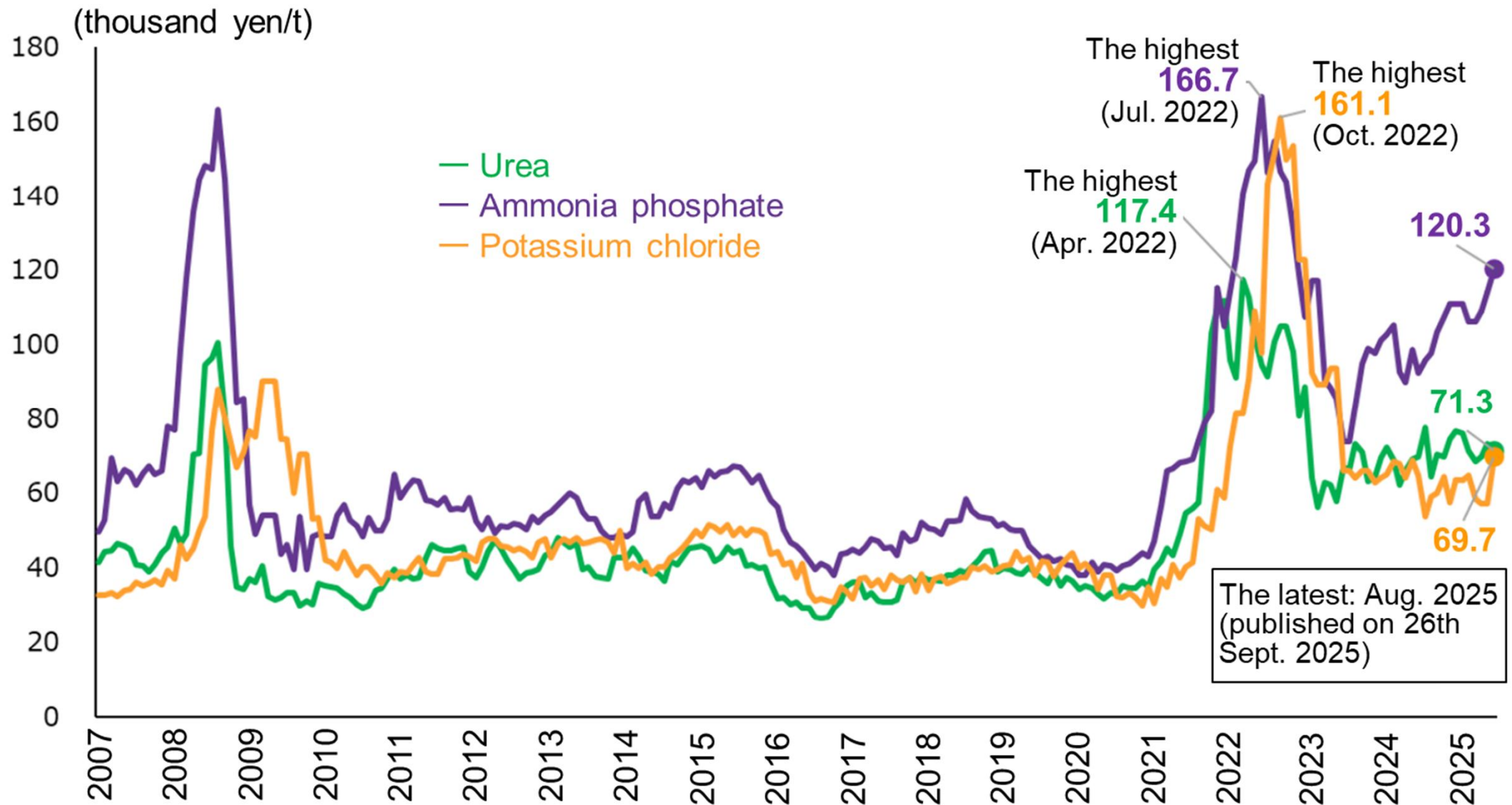


July 2023 - June 2024



Source. "Situation regarding Fertiliser" Ministry of Agriculture, Forestry and Fisheries, Government of Japan, September 2025

Trend of Customs Clearance Prices for Imported Fertiliser Raw Materials



Source. "Situation regarding Fertiliser" Ministry of Agriculture, Forestry and Fisheries, Government of Japan, September 2025

Policy for Strengthening Food Security

1st Meeting of Headquarters for Strengthening Food Security and the Agricultural, Forestry and Fisheries Sector

Date: 9 Sept. 2022

Attendees: Prime Minister
Chief Cabinet Secretary, Minister of Agriculture, Forestry and Fisheries
Minister of Land, Infrastructure, Transport and Tourism, and other relevant Ministers

Agenda: (1) New Developments in Agriculture, Forestry and Fisheries Policy under the New Capitalism
(2) Questioning, etc.
(3) Prime Minister's Statement

For Minister of Agriculture, Forestry and Fisheries to take the lead to formulate a package of emergency measures for the following issues.

Firstly, in collaboration with the Ministry of Land, Infrastructure, Transport and Tourism, **to ensure**

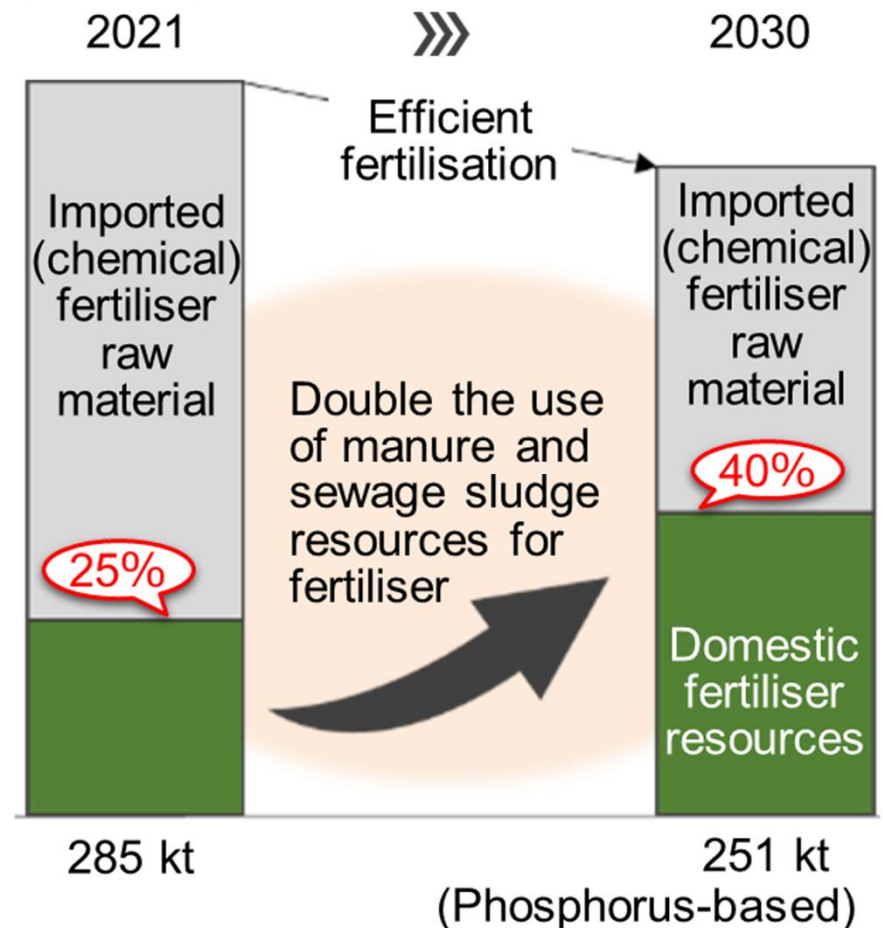
fertiliser domestic production and stable supply through expanding unused resources such as sewage sludge and manure, while promoting greening.



Policy Framework for Strengthening Food Security

Decision by Headquarters for Strengthening Food Security and the Agricultural, Forestry and Fisheries Sector on 27 Dec. 2022

Target



Direction and Stakeholders' Roles for Expanding Sewage Sludge Agricultural Use

Ministry of Agriculture, Forestry
and Fisheries (MAFF)



Ministry of Land, Infrastructure,
Transport and Tourism (MLIT)

The Public-Private Joint Study Committee for Expanding
Sewage Sludge Agricultural Use (Oct.-Dec. 2022)

Direction

Each stakeholder commits full efforts towards significantly expanding sewage sludge fertiliser use while the two Ministries, the agricultural sector and the sewerage sector collaborate to ensure safety and quality of sewage sludge fertiliser and promote food consumers' understanding, aiming for fertiliser production using domestic resources, stable supply of fertiliser and a resource circulating society.

Promote food
consumers'
understanding

Local governments
(Sewerage departments)

Efforts to provide safe and
reliable sewage sludge
according to fertiliser
producers' and farmers' needs

Local governments
(Agriculture departments)

Efforts to expand sewage
sludge agricultural use
according to local
characteristics

National government

Efforts to expand demand and
supply of sewage sludge
fertiliser through supporting
stakeholders' efforts and
promoting networking, etc.

Farmers/Japan Agricultural
Co-operatives (JA), etc.

Efforts to expand sewage
sludge agricultural use
according to local
characteristics

Fertiliser producers

To strive for produce
fertilisers according to
farmers needs, using sewage
sludge with safety and quality
ensured

Fundamental Policy of Sewage Sludge Treatment

2015 Amendment to Sewerage Act

“Sewerage authorities shall endeavour to recycle sewage sludge as fuel or fertiliser”.

Fundamental Policy of Sewage Sludge Treatment

In Mar. 2023, MLIT issued **the administrative notices** to sewerage departments of local governments requesting them to endeavour to manage sewerage while fully aware of the following fundamental policy:

- **Fertiliser use of sewage sludge should be prioritised and maximised** hereafter.
- Incineration is an effective means of reducing volume but should only be employed when fertiliser use through composting or drying is impractical. Even when incineration is employed, consideration should be given to fertiliser use of incineration ash and phosphorus recovery during the sludge treatment process.
- Fuel conversion is an effective method for sewage sludge recycling but should only be employed when composting or drying for fertiliser use is impractical. Even when fuel conversion is employed, consideration should be given to fertiliser use of dried sludge and phosphorus recovery during treatment process. Etc.

In Mar. 2023, MAFF and MLIT jointly issued **the administrative notices** to agricultural departments and sewerage departments of local governments requesting them

- to ensure **close co-ordination between the two departments of local governments**,
- to ensure **safety and quality of fertiliser use of sewage sludge**, and
- to promote **farmers' and food consumers' understanding**

so that fertiliser use of sewage sludge is maximised through composting and phosphorus recovery, etc. according to local characteristics.

Measures for Expanding Sewage Sludge Agricultural Use

[1] Programme of Analysis of Heavy Metals and Fertiliser Nutrients towards Expanding Sewage Sludge Fertiliser Use

[4] Technology Verification of Phosphorus Recovery in Sludge Treatment

[2] Programme of Project Formulation for Promoting Sewage Sludge Fertiliser Use

[5] National Council for Expanding Domestic Fertiliser Resources Use

[3] Financial Assistance in Project Planning and Facility Construction for Sewage Sludge Fertiliser Use

[6] Measures for Ensuring Fertiliser Quality and New Official Standards of Fertiliser

[1] Programme of Analysis of Heavy Metals and Fertiliser Nutrients towards Expanding Sewage Sludge Fertiliser Use

Support to adopted local governments (sewerage) for analysis of heavy metals and fertiliser nutrients towards expanding secure fertiliser distribution channels.

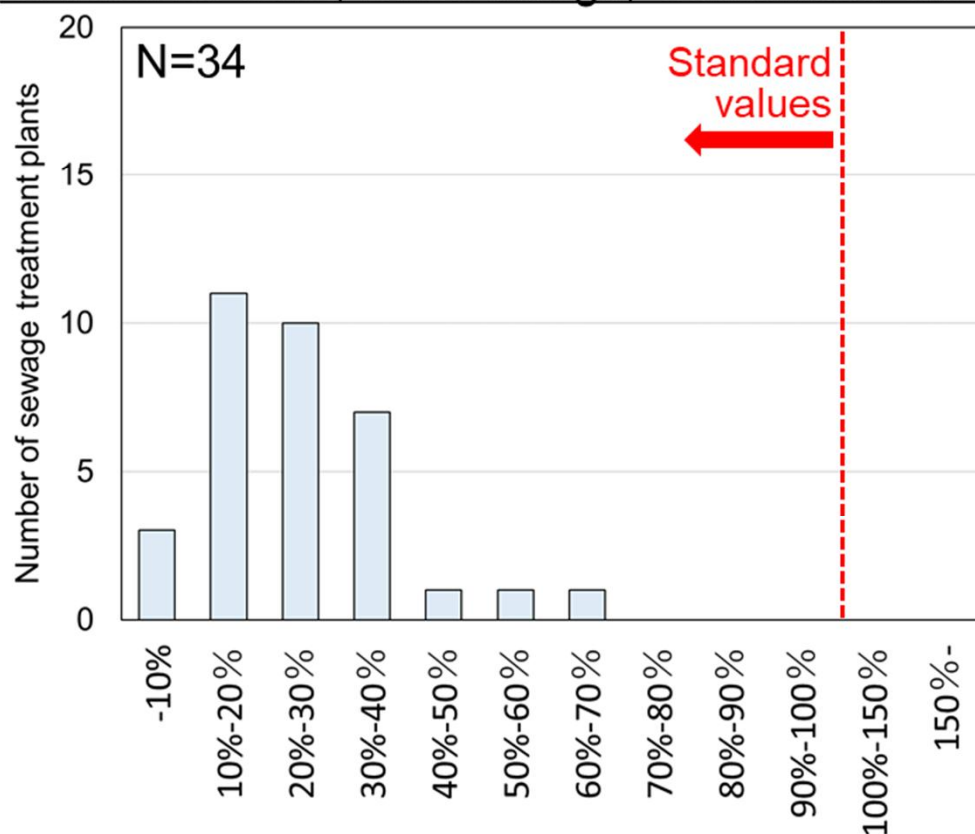
- Target: dewatered cake, incineration ash, etc.
- Parameters: Cd, Pb, Cr, As, Hg, Ni, T-N, T-P₂O₅, T-K, etc.
- Frequency: around four times in consideration of seasons

Adopted local governments' sewage treatment plants: 118 in FY 2023 - FY 2024, 49 in FY 2025

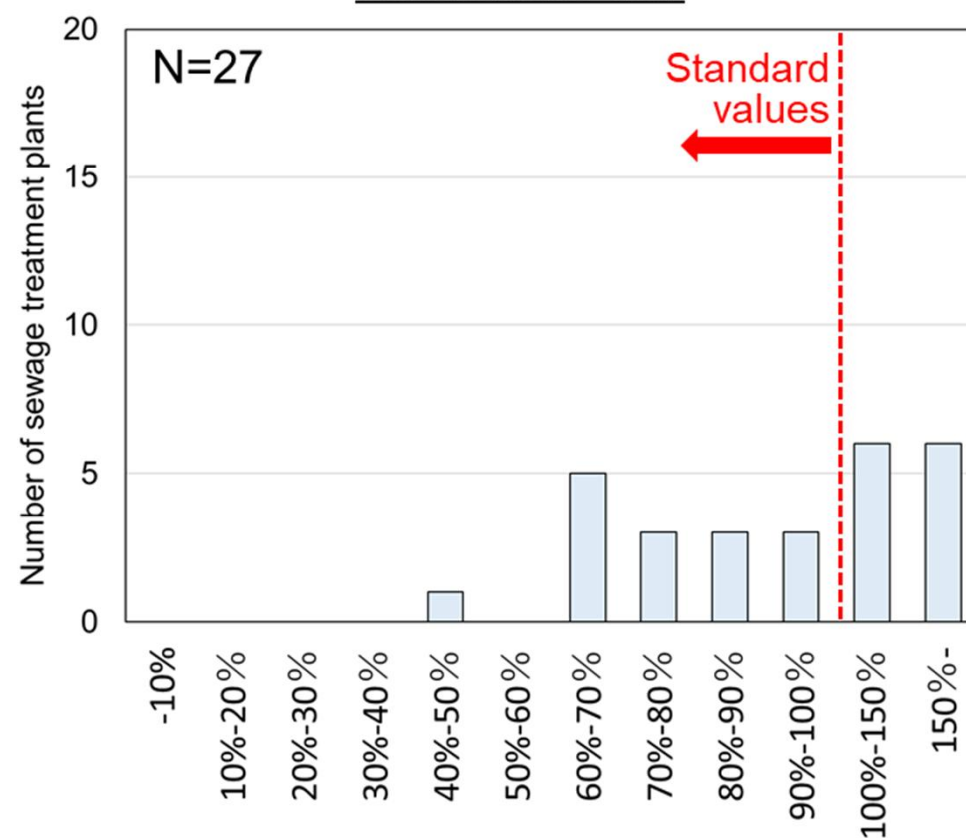
Result of heavy metals analysis in FY 2024

(The highest ratio of heavy metals relative to the standard values)

Dewatered cake, Dried sludge, Carbonised sludge



Incineration ash



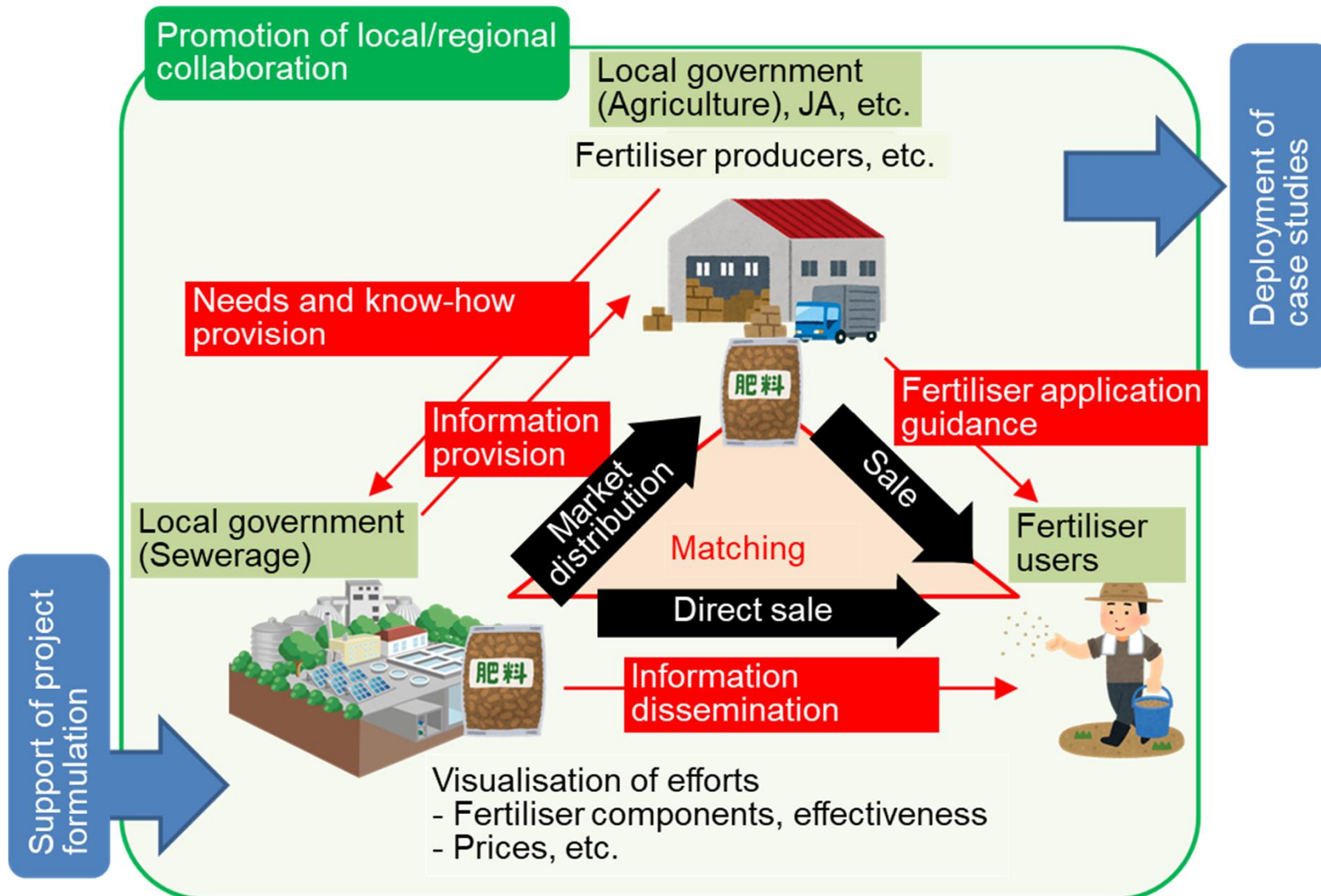
Standard values: The maximum permissible levels of harmful components as stipulated in the Act on the Quality Control of Fertiliser.

[2] Programme of Project Formulation for Promoting Sewage Sludge Fertiliser Use

Support to adopted local governments (sewerage) for project formulation to secure fertiliser distribution channels.

- Necessary surveys
- Meetings organization, according to the challenges and needs by local governments

Adopted local governments: 20 in FY 2023, 19 in FY 2024, 18 in FY 2025



Meeting of stakeholders



Sewage treatment plant tour for fertiliser users

[3] Financial Assistance in Facility Construction and Feasibility Study, etc. for Sewage Sludge Fertiliser Use

Financial Assistance in Project Planning, etc.

Financial assistance to local governments (sewerage) in fertiliser components and heavy metals analysis, project planning and analysis instruments purchase for sewage sludge fertiliser use

Subsidy ratio: 10/10

Ex. Compost Pelletisation in Tsuruoka City

- Conduct necessary investigations for pelletising compost according to its properties, shape and composition, with a view to verifying low-cost pelletisation technology and exploring commercialisation.



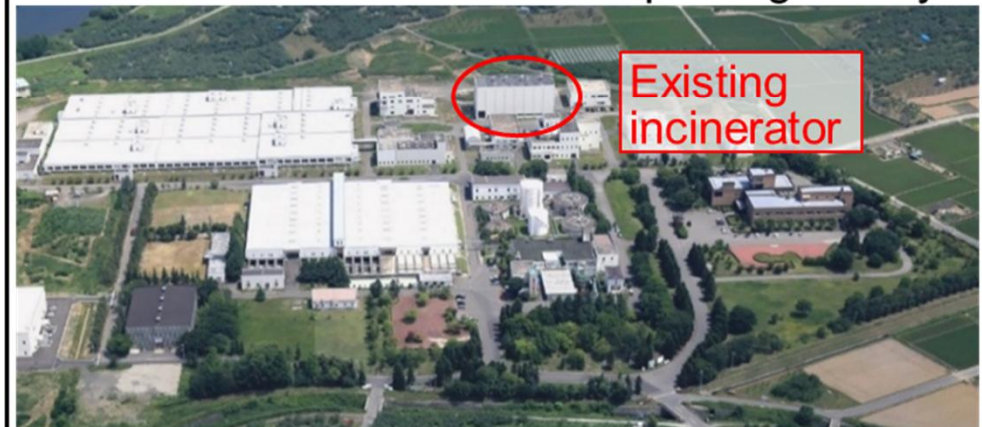
Financial Assistance in Facility Construction

Intensive financial assistance to local governments (sewerage) in constructing facilities for sewage sludge fertiliser use, such as composting facility and phosphorus recovering facility

Subsidy ratio: 5.5/10 to municipalities
2/3 to prefectures

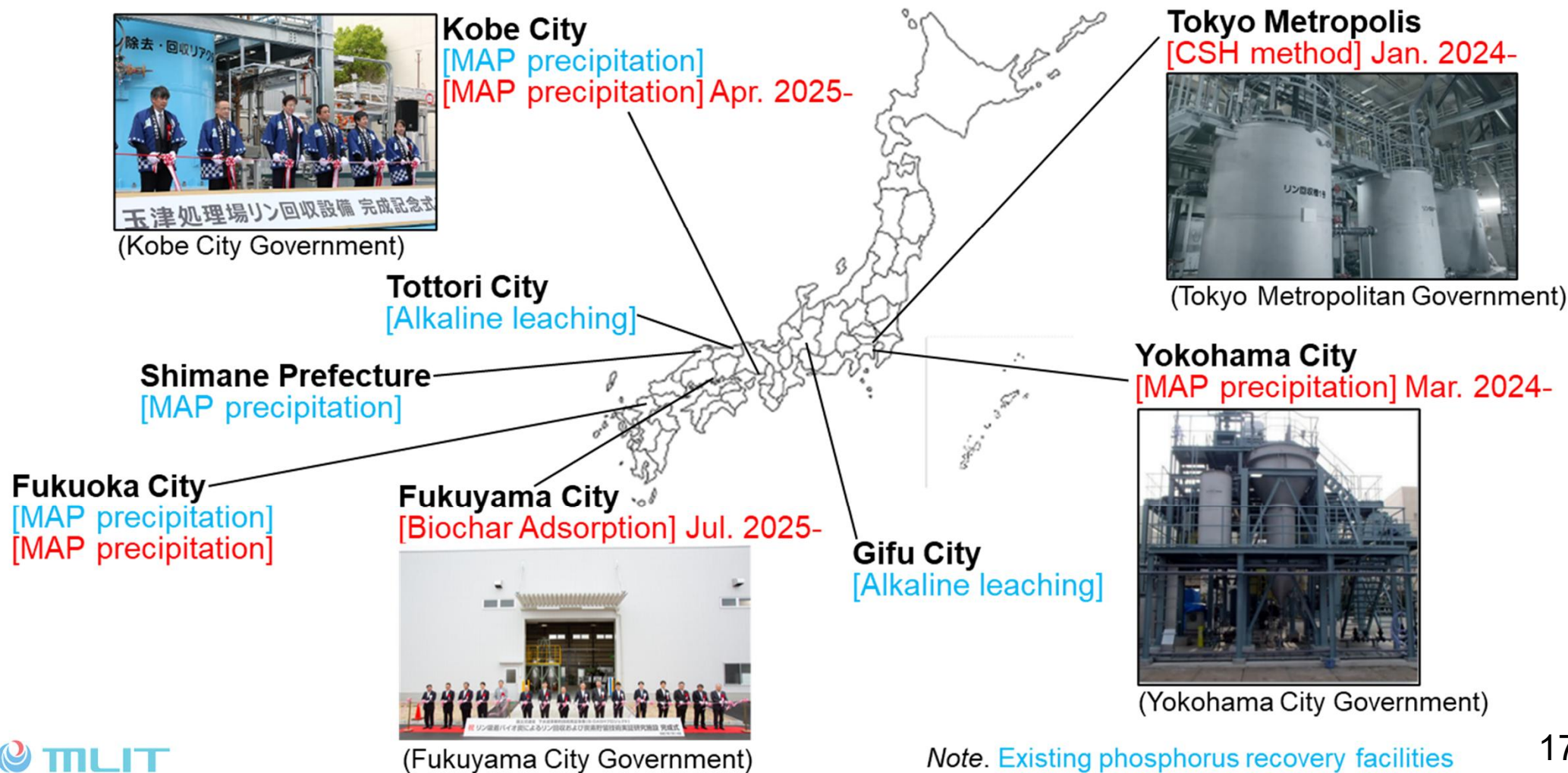
Ex. Iwakigawa Sewage Treatment Plant, Aomori Prefecture

Incinerator → Composting facility



[4] Technology Verification of Phosphorus Recovery in Sludge Treatment

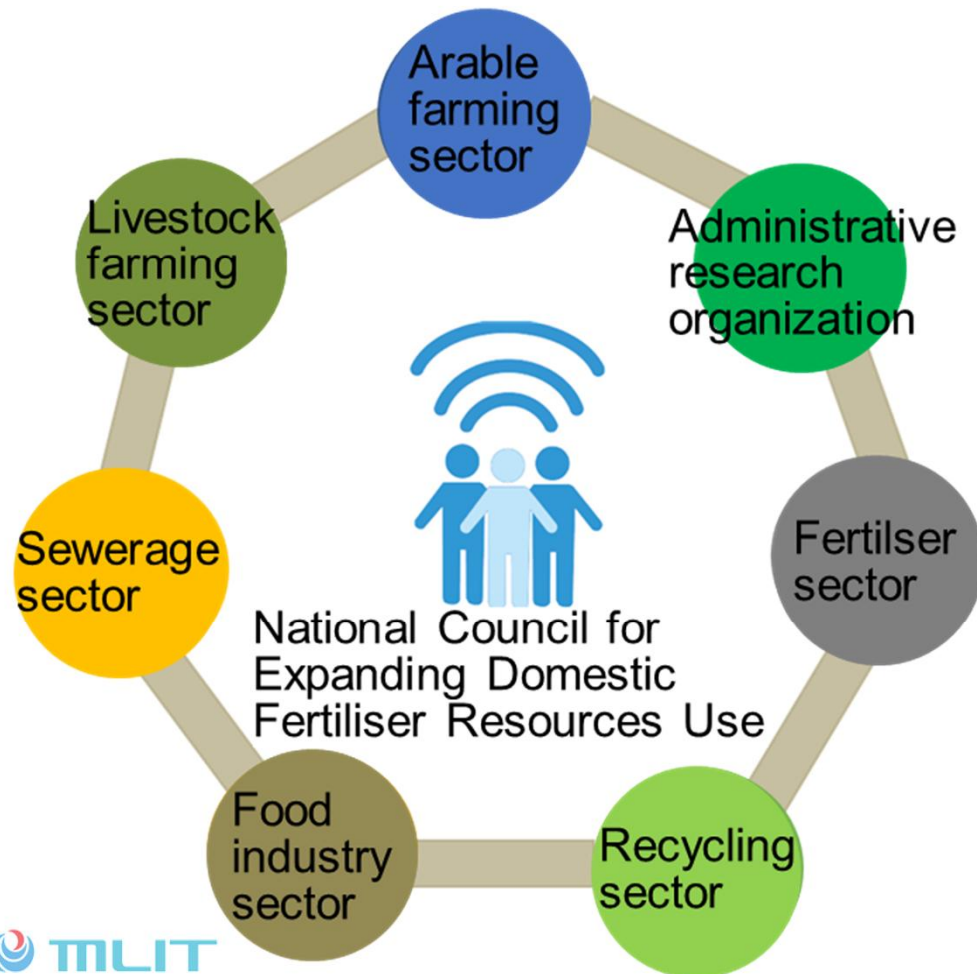
- ✓ To verify technologies enabling efficient and low-cost phosphorus recovery, MLIT conducts verification projects from 2023 by B-DASH (Breakthrough by Dynamic Approach in Sewage High Technology) Programme.
- ✓ In B-DASH Programme, initiated in 2011, MLIT takes the lead in constructing target technologies' full-scale facilities in the sewerage field of local governments, conducts their technical verification and formulates their technical guidelines, aiming for their nationwide deployment.
- ✓ **Projects in five local governments were adopted in 2023-2024 and their technical verification are ongoing.**



[5] National Council for Expanding Domestic Fertiliser Resources Use

For expanding domestic fertiliser resources use, the National Council was established in Feb. 2023 to bring together stakeholders including fertiliser raw material suppliers, fertiliser producers and arable farmers, etc. and to share initiative/direction and foster momentum.

It also aims to promote collaborative efforts by the stakeholders.



Support wide-ranging collaborative efforts

Provide matching opportunities to stakeholders.



(Matching Forum in Dec. 2024 in Sapporo City)

Promote efforts for expanding in production site

Provide the relevant information such as benefits of and key considerations for introducing domestic fertiliser in production sites

Deploy best practices horizontally

Provide relevant information

Share the various information, experiences and knowledge of the stakeholders



(Ceremony of Award for Expanding Domestic Fertiliser Resources Use in Jan. 2025)

Fertiliser Regulation System

Registration/ Notification system

Quality check
before distribution

+

Labeling system

Quality assurance
during distribution

+

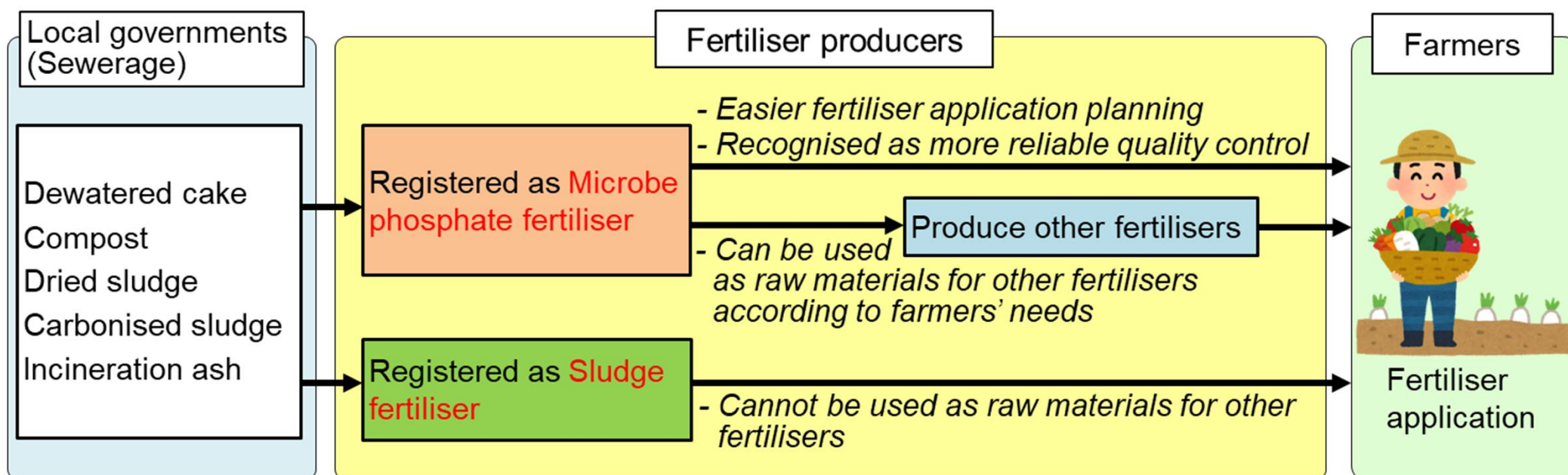
On-site inspections

Periodic follow-up



The Act on the Quality Control of Fertiliser requires fertiliser producers to register their products according to **the official standards** and notify authorities when production begins, in order to ensure the quality of fertiliser.

For expanding sewage sludge fertiliser use, **the official standards “Microbe phosphate fertiliser”** was established in Oct. 2023, which guarantee phosphate of fertiliser component under thorough quality control.



Note. Local Governments (Sewerage) can be also fertiliser producers.

Towards Maximising Agricultural Use of Sewage Sludge in Japan

Toshiaki Yoshida

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Water Supply and Sewerage Planning Division,
Water and Disaster Management Bureau,
Ministry of Land, Infrastructure, Transport and Tourism,
Government of Japan