WEPA Water Environment Partnership in Asia
アジア水環境パートナーシップ

Updates of Water Environment Governance in Japan

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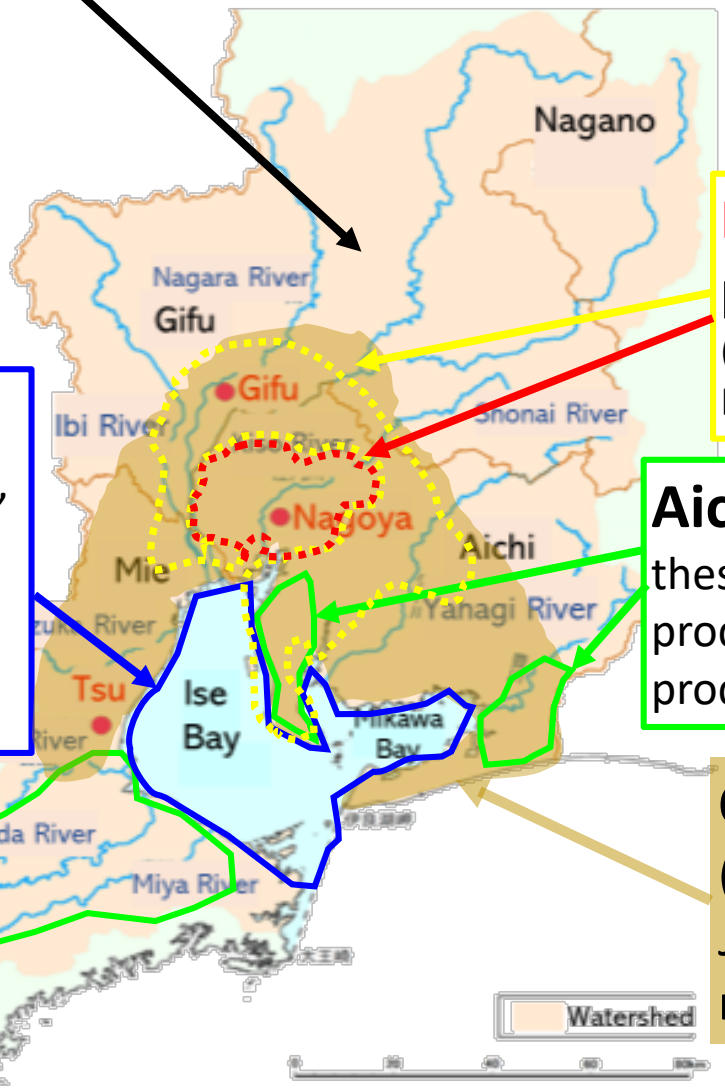
1. Watershed

- Ise Bay is one of the three largest bays in Japan, along with Tokyo Bay and Osaka Bay.
- The Chukyo Metropolitan Area (Aichi, Gifu, and Mie) is one of the three major metropolitans, along with the Capital and Kinki.

https://www.isewan-db.go.jp/IsewanKankyo/ik01.asp

1. Watershed

Gifu and Nagano: Upper reaches of rivers with rich natural environment and rice fields



Heavily and Densely populated areas
(Heavily: Pop/km^2 > 5000;
Densely: 1000< Pop/km^2 < 5000)

Bays: Main species: Shellfish, Pearl, Sea bream, Yellowtail, and Laver

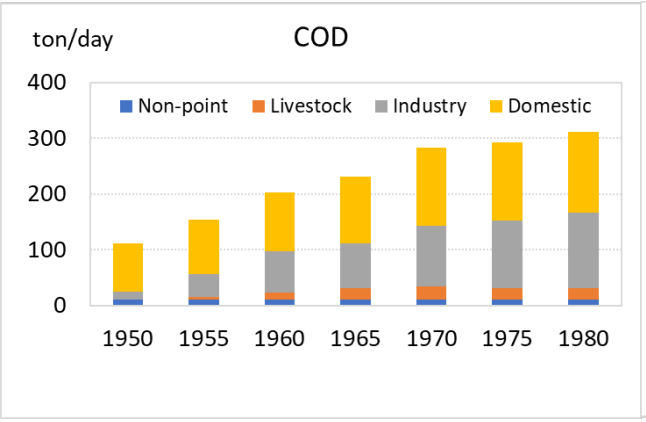
No.1 producer of some shellfishes

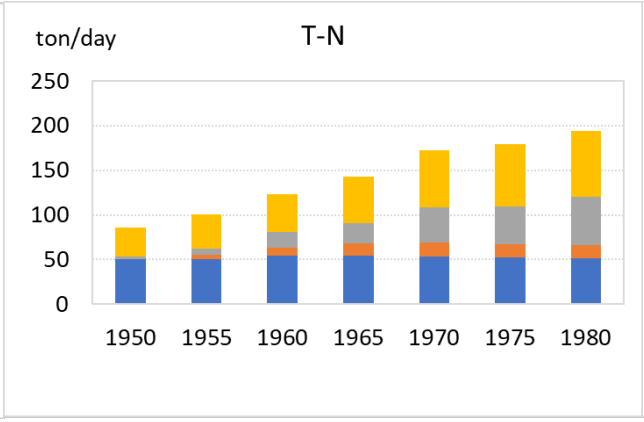
Aichi: Many livestock farms in these areas (Poultry=4th highest production, Livestock=10th highest production in the country)

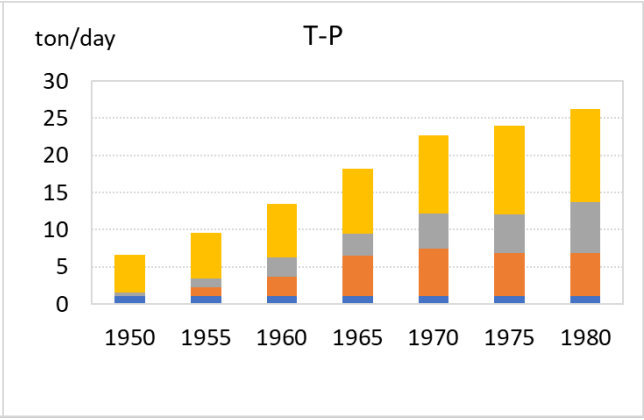
Chukyo industrial zone
(Largest industrial zone in Japan: 68% mechanical, 10% metal, 7% chemical in 2020)

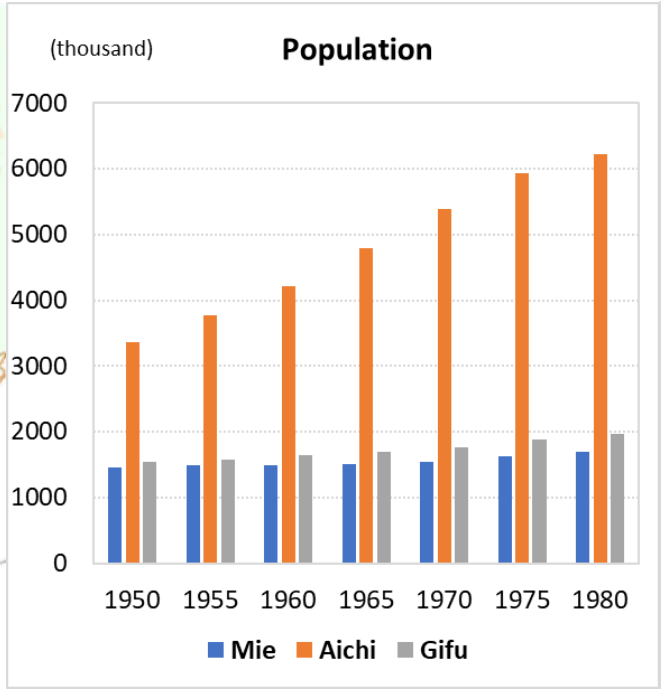
Mie: Branded beef, wheat, fruits, green tea, etc.

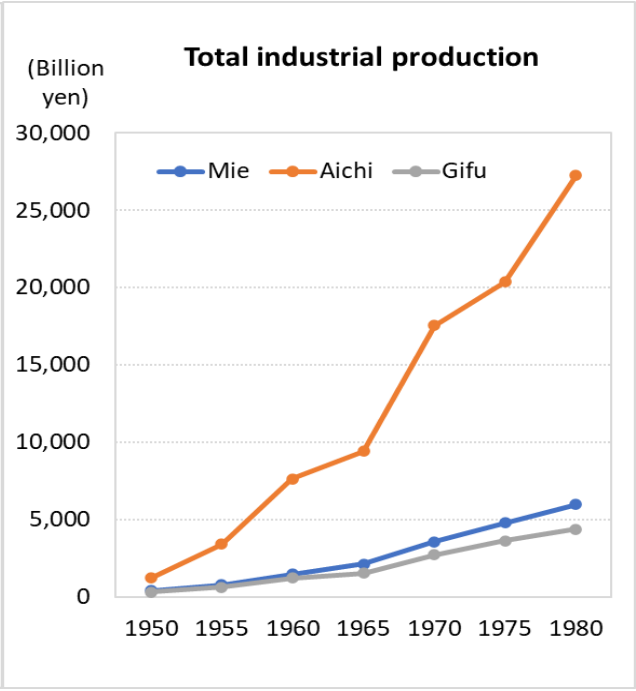
2. Pollutant loads in the watershed





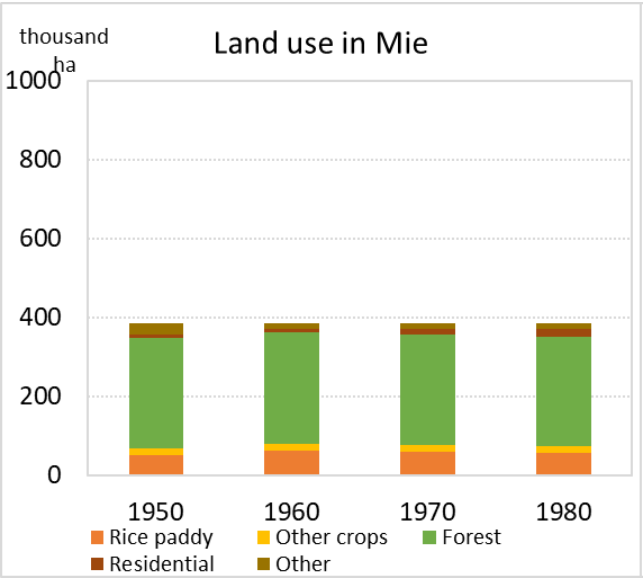


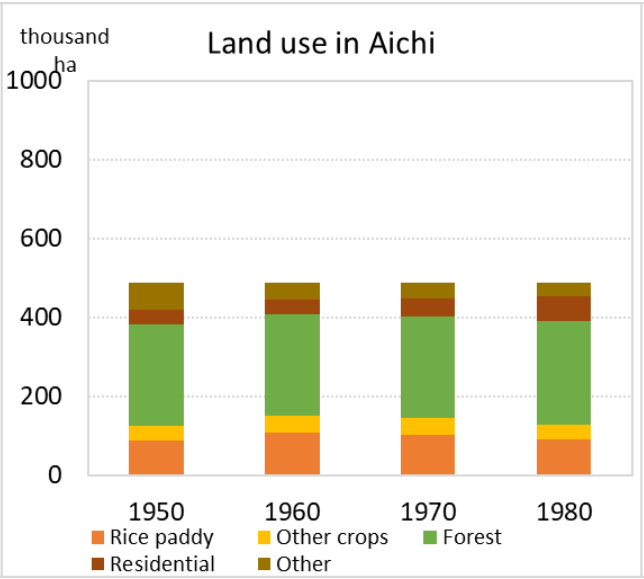


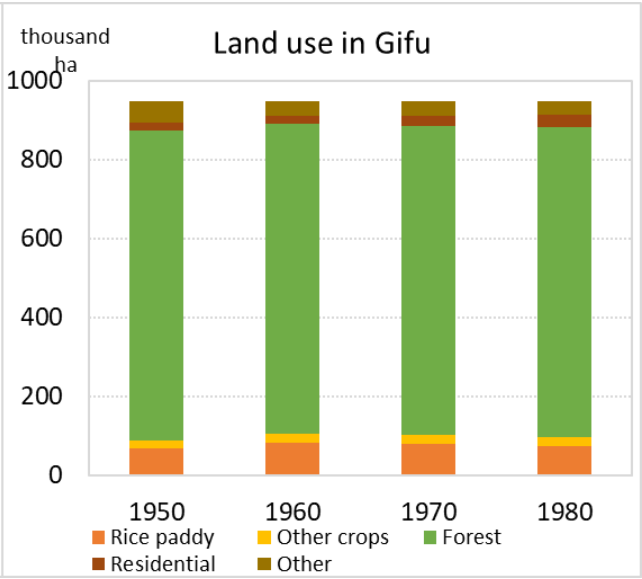


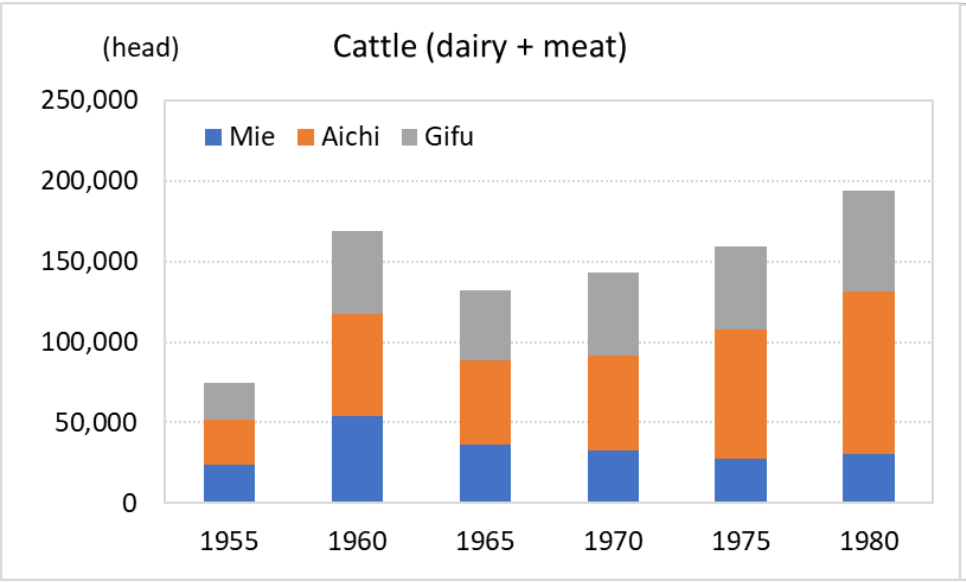
Data source: Satoshi Chiba (2021)

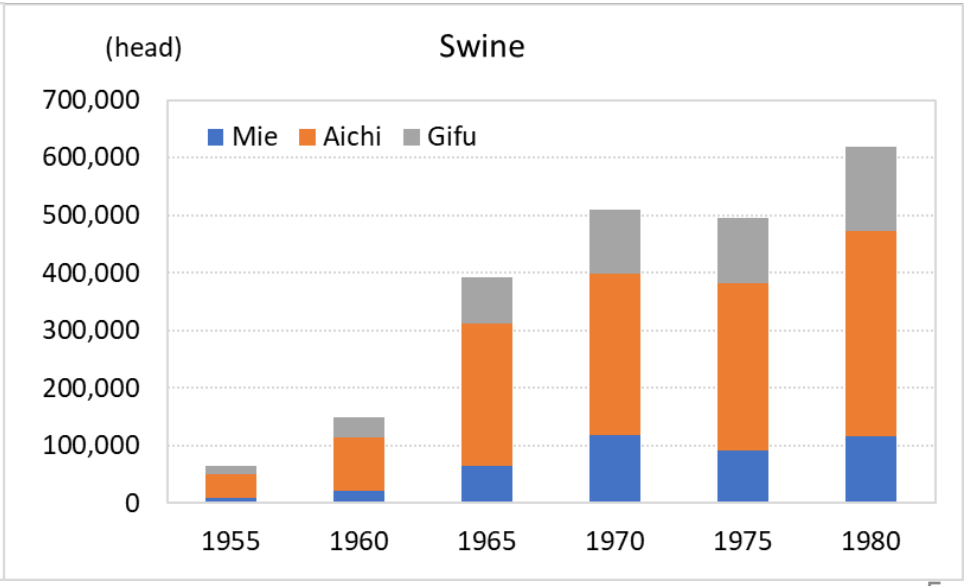
3. Issues in the watershed











Data source: Satoshi Chiba (2021)

3. Issues in the watershed

- The region has been a major industrial zone due to:
  - Convenient location (middle of major cities, ports)
  - Availability of water (rivers)

- Population, industrial production, and agricultural production grew fast between 1950-1980
- The vast natural environment in Gifu nurtures rich water, providing abundant water in the region
- Aichi is the top producer of seaweed, prawns, and clams, and Mie is one of the top 10 producers of main fish species

Population growth and further industrialisation in the region led to an increase in the discharge of pollutants into the bay…

➢ The bays became increasingly polluted (red tide, green tide, hypoxic water masses, decrease in tidal flats, shallow areas and seaweed beds, decrease in natural beaches)

4. Measures taken to address issues

National legislation (uniform regulations nationwide):

- Sewerage Law **1958** (amended in **1970**) → Domestic wastewater (**A**)
- Basic Environment Law (WQS) **1967** (**B**)
- Water Pollution Control Law (EWQS) **1970** → Point-sources (**C**)
- Johkasou Law **1983** → Domestic wastewater (**D**)

Ordinance at the subnational level (Aichi)

a. Ordinance setting effluent standards based on Article 3 (3) of Water Pollution Control Law **1972** → Point-sources (**C**)
b. Total Pollutant Load Control System based on the Water Pollution Control Law **1980**→ Point-sources (**C**)
c. Ordinance on the registration of Johkasou maintenance and inspection technicians **1985** → Domestic wastewater (**D**)
d. Designation of priority areas for managing domestic wastewater based on the Water Pollution Control Law **1991** → Domestic wastewater (**C**)
e. Aichi Basic Environmental Ordinance **1995** (**B**)
f. Ordinance concerning the Preservation of the Living Environment of Prefectural Residents **2003**
g. Basic Policy on Environmental Education **2005**

4. Measures taken to address issues

Actions (Aichi)

- ☐ Total Pollutant Load Reduction Plan (**1980**) (**b**)
- ☐ Aichi Basic Environmental Plan (**1997**) (**e**)
- ☐ Basic Policy on Domestic Wastewater Management (**2003**) (**f**)
- ☐ Aichi Water Cycle Regeneration Master Plan (**2008**)

Domestic	Industrial	Agricultural/NP
● Guidelines for promoting measures to manage domestic wastewater (**1980**) (C)	● Guidance on measures on wastewater from small business establishment (**1981**) **(a)**	● Guidelines on the proper use of pesticides at golf courses (**1989**) (B)
● Guidelines for installation, maintenance, and management of Johkasou (**1982**) **(c)**		
● Guidance on Johkasou management (**1985**) **(c)**		
● Ise Bay comprehensive eutrophication control plan (**1982**, repealed in 2004) **(b)**		
● Mikawa Bay comprehensive eutrophication control plan (**1995**) **(b)**; Mikawa Bay Satoumi regeneration programme (**2011**) ; Mikawa Bay environmental regeneration project action plan (**2014**)		
➢ Mikawa Bay environmental regeneration partnership club (regional cooperation) (**2015**)		

https://kankyojoho.pref.aichi.jp/DownLoad/DownLoad/hakusyo/r3/25_03siryou_nenpyou.pdf

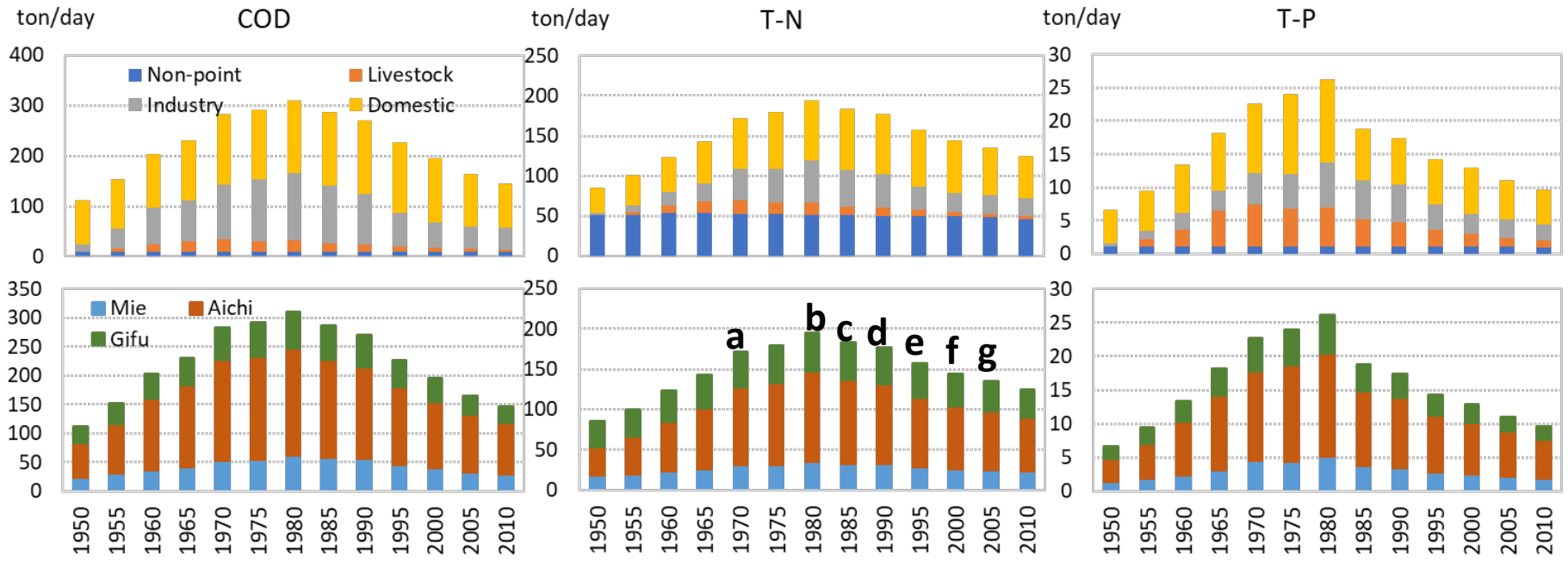
4. Measures taken to address issues

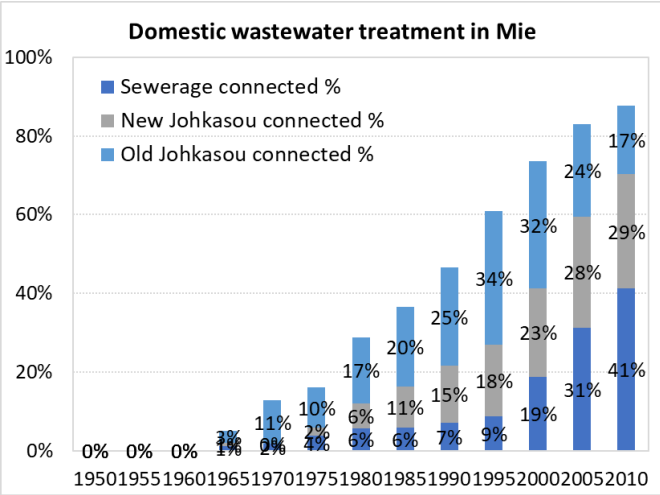
Division of roles

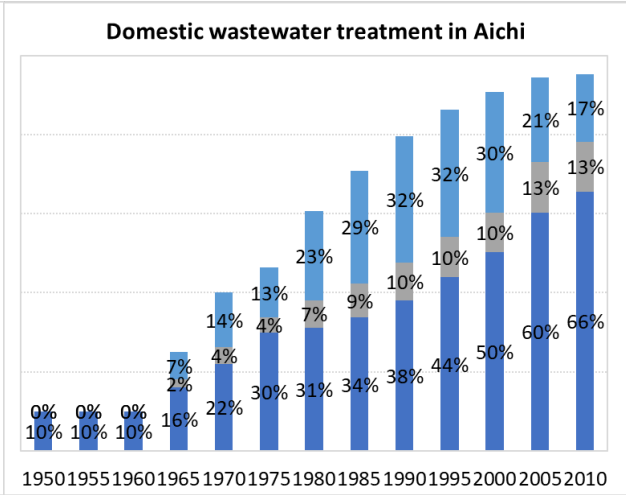
Institution responsible for implementing actions in the 2nd Action plan for the restoration of Ise Bay)

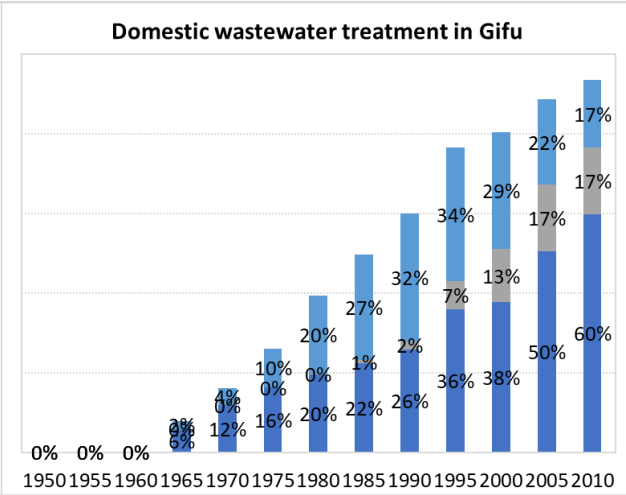
Measures	Who is responsible
Support for environmentally friendly agriculture	Prefectures
Sewerage management	Prefecture, Nagoya City
Wastewater management in rural community	Prefectures
Johkasou promotion	Prefectures
River restoration	Prefectures and municipalities
Promoting clean agriculture	Gifu
Restoring natural river bank	Gifu
Restoring natural environment	MLIT
Restoration of coastal areas	Prefectures (Aichi and Mie)
Fostering interests through science	Prefectures
Creating learning environments and developing human resources	Prefectures

5. Outcomes



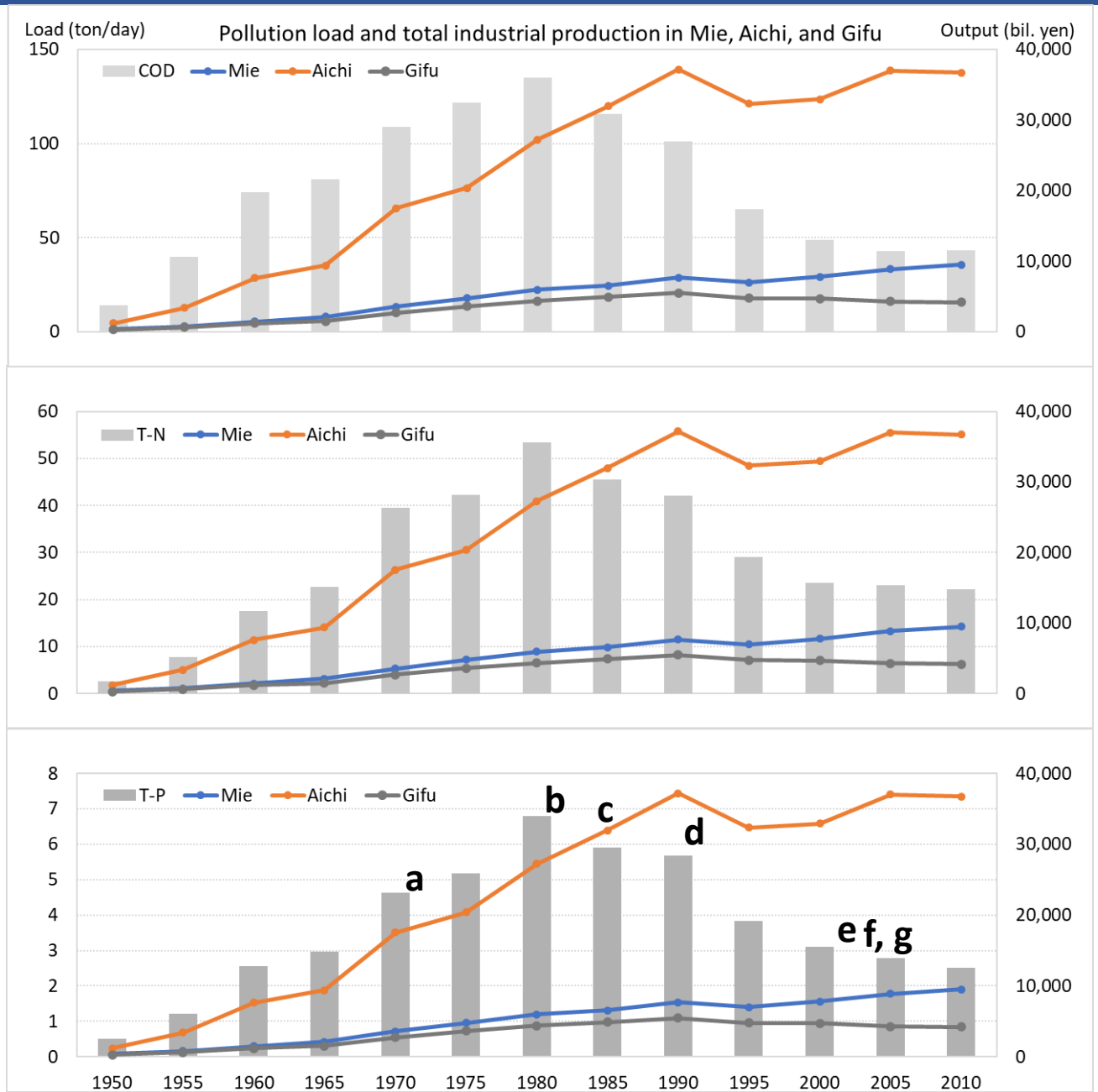




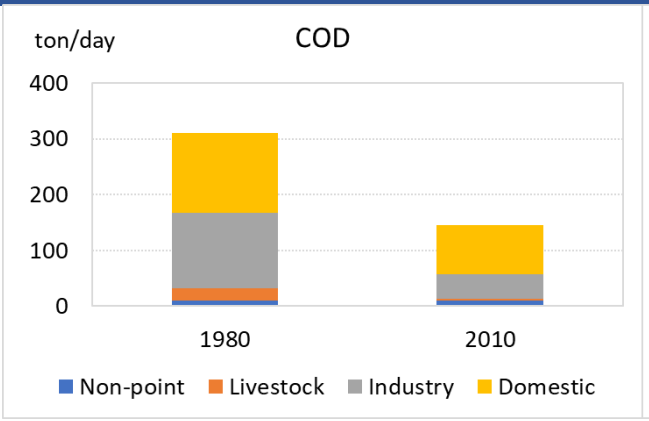


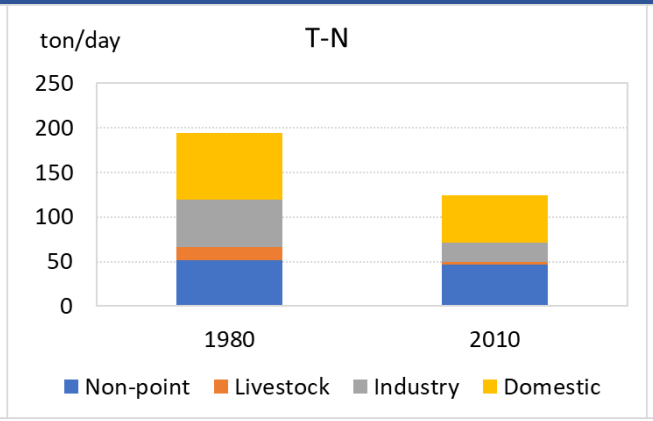
a, b, c, d, e, f: Year of implementation of the ordinance in Aichi (PPT#7)

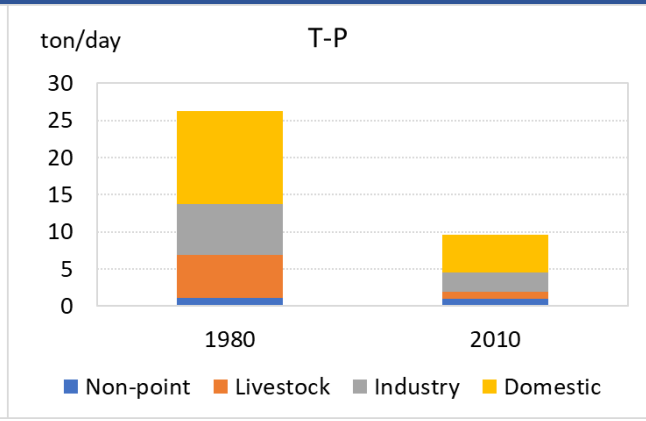
5. Outcomes


Load (ton/day)
Pollution load and total industrial production in Mie, Aichi, and Gifu
Output (bil. yen)
COD
Mie
Aichi
Gifu
150
100
50
0
40,000
30,000
20,000
10,000
0
T-N
60
50
40
30
20
10
T-P
8
7
6
5
4
3
2
1
a
b
c
d
e
f, g
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010

5. Outcomes







- ✓ Industrial wastewater: Significant reduction in pollutant loads
- ✓ Domestic wastewater: Pollutant loads on the decline
- ✓ Non-point: T-N loads does not change that much
- ✓ Bays: While pollutant loads decreasing, other issues were identified (e.g. proportion of low quality laver in total black laver production increasing)

↑
New problem

Laver
Good quality Low quality

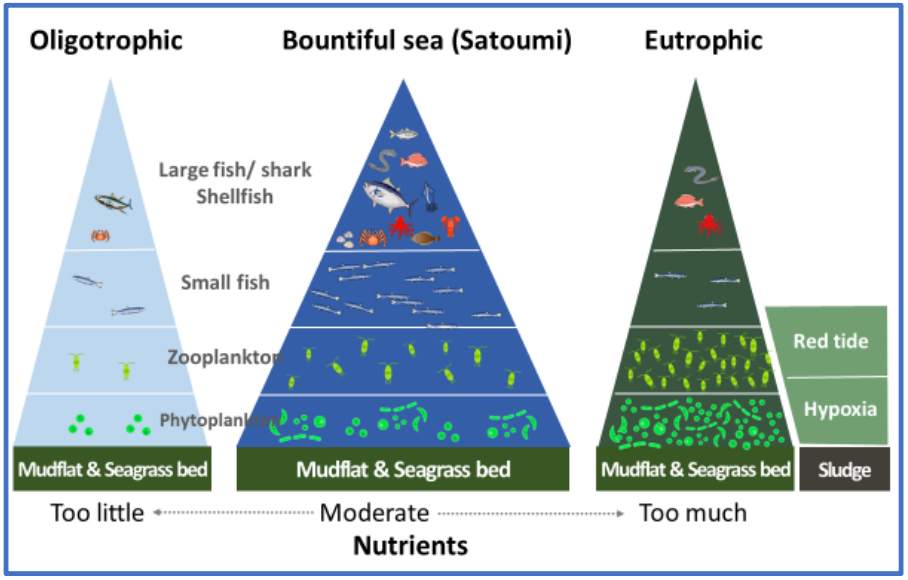
6. Further challenges

While controlling the pollutant loads, problems were found in the sea…

- Meeting the environmental WQ standard for COD, and addressing high COD in the sediment
- Tackling the chronic occurrence of red tide, green and tide, and hypoxic water masses
- Managing nutrient discharge
- Fostering interest in the coastal areas and river basins among people
- Restoring tidal flats, shallow areas, and seaweed beds for aquatic species

<u>What we aim to achieve in coastal areas, in addition to addressing pollutant loads:</u>

In coastal areas, we would like to see a 'bountiful sea' (Satoumi), where the environmental standards are met and there is a balance between biological productivity and biodiversity. Both nutrient management in coastal areas and the restoration and conservation of aquatic ecosystems will be promoted simultaneously.



Subnational government

- **Setting up the overall goal (how people want the sea to be)**
- **Developing indicators to evaluate the progress and monitoring framework**

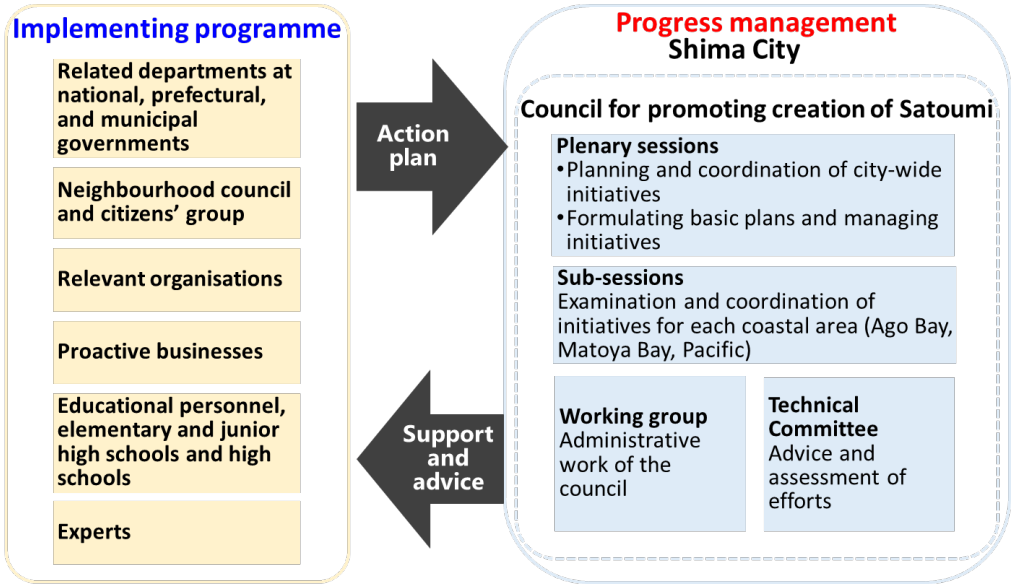
→ See some examples in the next slide

6. Further challenges

Satoumi Programme in Shima City, Mie

Goal

To be a city of 'Satoumi' with 'earning' and 'learning' opportunities and fun



Source: Shima City

Indicator to assess the achievement (1st phase)

Bountiful sea (Material cycle: conservation and restoration)

All areas

- Number of tidal flats and seaweed beds regenerated
- Thinning rate relative to planted forests
- Population connected to wastewater treatment systems
- Awareness of 'Satoumi'

Ago Bay

- Biological composition
- Habitat (area and environment)
- Production
- Load and seawater replacement
- Decomposition
- Catch release

Biodiversity and productivity

- Number of fishing communities involved in management
- Producer prices of major products
- Number of products certified as 'Satoumi' brand
- Gross output of agriculture, forestry, and fisheries
- Number of people who consume local products

Symbiosys, interaction, and livelihood

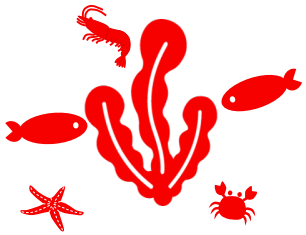
- Number of people attended for training or study tours
- Number of tourists participated in hands-on visitor experience tour
- Annual sales of local products
- Number of tourists
- Number of local guides
- Number of participants in satoumi study workshop
- Number of participants in environmental education
- Number of workshops/lectures to learn about the region
- Number of participants in major traditional events
- Number of people participating in cleanup activities
- Percent of people who spent their leisure time in nature

Amendment: Law Concerning Special Measures for Conservation of the Environment of the Seto Inland Sea [April 2022]

Adding the perspective of 'climate change' to the basic principles, as well as the comprehensive promotion of the creation of a 'satoumi' for the new era

From a single focus on nutrient 'emission control' to to detailed 'management'

Contribution to securing diverse fisheries resources through the establishment of the Nutrient Management System, which enables nutrient supply to some coastal areas according to the needs of each region.



Boosts the regeneration and creation of seaweed beds that becomes a sink for greenhouse gases

Contribution to creation of seaweed beds and tidal flats that contribute to biodiversity conservation and are expected to serve as blue carbon, by enabling to designate the created and restored seaweed beds and tidal flats as conservation areas.

Promoting the reduction of marine plastic waste generation throughout the region surrounding the Inland Sea.

Developing measures to control the generation of marine plastic waste and other waste under the responsibility of the national and local governments in the Seto Inland Sea, where coastal initiatives are particularly important because of the enclosed sea.

The Hyogo Prefecture Nutrient Management Plan (October 2022)

- Based on Law Concerning Special Measures for Conservation of the Environment of the Seto Inland Sea, which was amended in April 2022, Hyogo Prefecture formulated a nutrient management plan in October 2022, ahead of other related prefectures and cities in the Seto Inland Sea.
- Measures to increase nutrient discharge were implemented at five private plants and 28 sewage treatment plants.

Overview of the plan

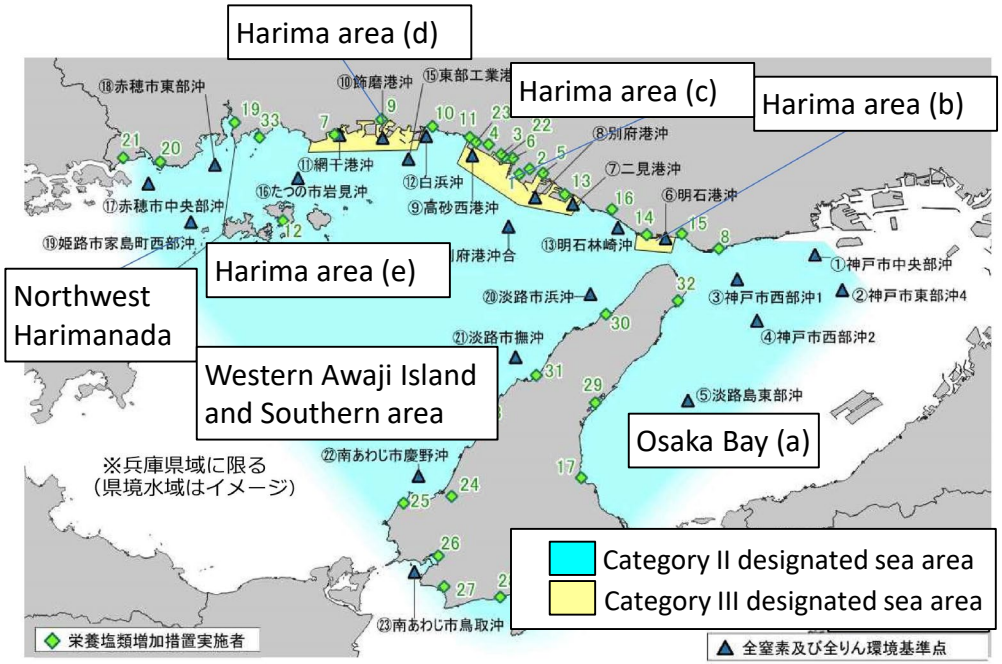
Target: T-N, T-P

WQ goal: B/W lower limit of prefectural ordinance (llpo) and environmental quality standard (eqs)

water classification	T-N (mg/L)		T-P (mg/L)	
	LLPO	EQS	LLPO	EQS
II	0.2	0.3	0.02	0.03
III.	0.2	0.6	0.02	0.05

Target area: Area where fishery is important and there is a risk of the T-N concentrations falling below LLPO

Osaka Bay (a), Harima area (b-e), Northwest Harimanada, Western Awaji Island and Southern area



Implementers of the measure

5 private plants	(Kobe Steel, Kansai Coke & Chemicals, Kaneka Corporation, Suntory Products, Taki Chemical)
28 sewerage treatment plants	Kakogawa, Ibogawa, Tarumi, Chubu Sekisui-en, Akashi Futami and 23 other plants.

Outline of Japan's National Action Plan on Sustainable Nitrogen Management

September 2024

- In accordance with **the UNEA resolutions on sustainable nitrogen management,** Japan's national action plan on sustainable nitrogen management was formulated based on **the 6th Basic Environmental Plan**.
- As an **integrated approach to conservation and management** of **the water and atmospheric environment** with **decarbonization, resource circulation and symbiosis with nature**, **collaborative projects** among relevant ministries will be developed to **benefit societies and regions** through nitrogen management.
- Japan will contribute **to Asian countries' nitrogen management** by **promoting knowledge and experience sharing**, **capacity building** and **technology transfer**.

1. Achievements of nitrogen management and remaining issues

- Set emission standards for NOx discharged from factories and allowable limits for NOx from mobile sources such as automobile exhaust gas regulating the total amount of NOx emission with the Air Pollution Control Act.
- Established effluent standards for factories or workplaces discharging effluent with the Water Pollution Prevention Act.

→As a result of the efforts, **air and water pollution caused by reactive nitrogen in Japan has been improved dramatically**.

- Not achieving the environmental standards for **nitrate nitrogen and nitrite nitrogen in the groundwater** and **total nitrogen in lakes** in some areas continuously.
- **In some enclosed seas**, there are **deficiencies in nutrients affecting marine resources**.
- Balancing **the expected increasing use of ammonia fuel for carbon neutrality and the** reduction in nitrogen emissions to the atmospheric environment is crucial.
- Expecting consolidation of scientific knowledge, **elaboration on the nitrogen inventory** and further technology developments for establishing nitrogen supply chain.

2. Integrated approaches of environmental management with CN, CE, NP

Establishing the comprehensive material flow of nitrogen, which is across various media such as water and air and considering effective actions.

(1) Carbon Neutral

- **Providing nutrients from wastewater treatment facilities** to realize the "Clean and Rich Sea" while examining **energy efficiency**.
- **Improving water quality** in rivers, lakes and groundwater sourcing drinking water and utilizing **livestock manure for energy** .
- Utilizing **technologies for NOx emission control** to address **the increasing use of ammonia**.

(2) Circular Economy

- Facilitating best practices of fertilizer and livestock manure management, **the use of manure and sewage sludge resources**.
- Effective use of **bottom sediment resources of eutrophicated lakes**.
- Promoting ethical consumption and reducing food loss.
- Considering **nitrogen supply chain.**
  e.g.) recovering ammonia from wastewater treatment facilities.

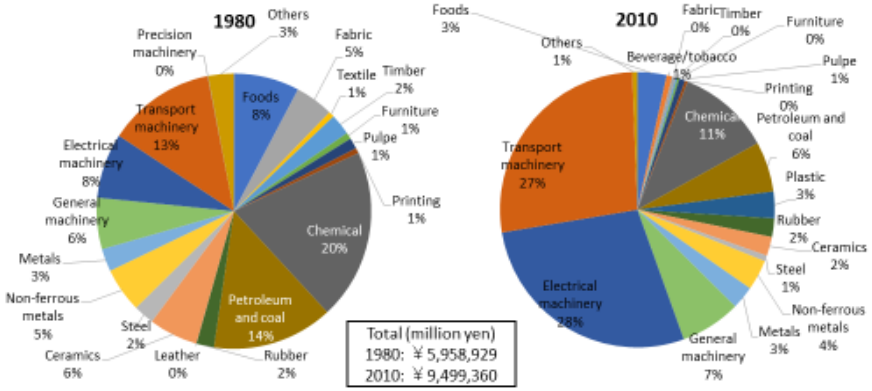
(3) Nature Positive

- **Realizing "Clean and Rich Sea"** through promoting active operations management for nutrients in wastewater treatment facilities, and **conservation and restoration of seaweed beds and tidal flats**.

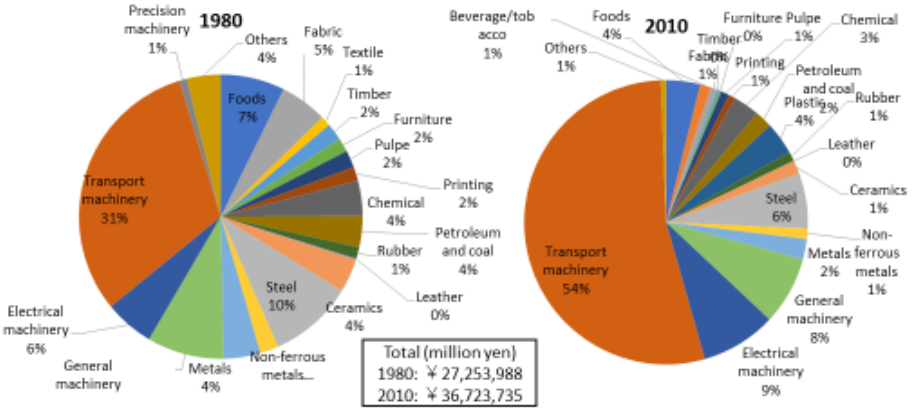
3. International Cooperation on Sustainable Nitrogen Management

- Sharing Japan's knowledge and experience and facilitating capacity building for administrative officials with **EANET** (Acid Deposition Monitoring Network in East Asia) and **WEPA** (Water Environment Partnership in Asia).
- Promoting introduction of Japan's technologies through **the Cobenefits projects** of air quality improvement and climate change mitigation and **the Model Project for improvement of Water Environment in Asia**.

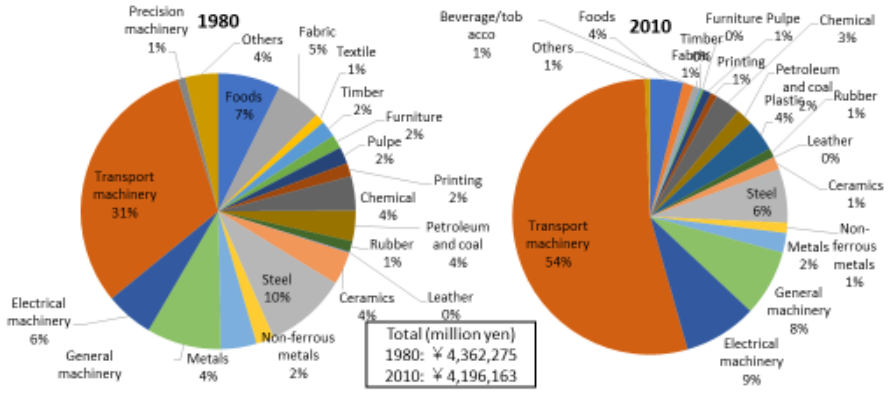
Appendix



Industrial production in Mie



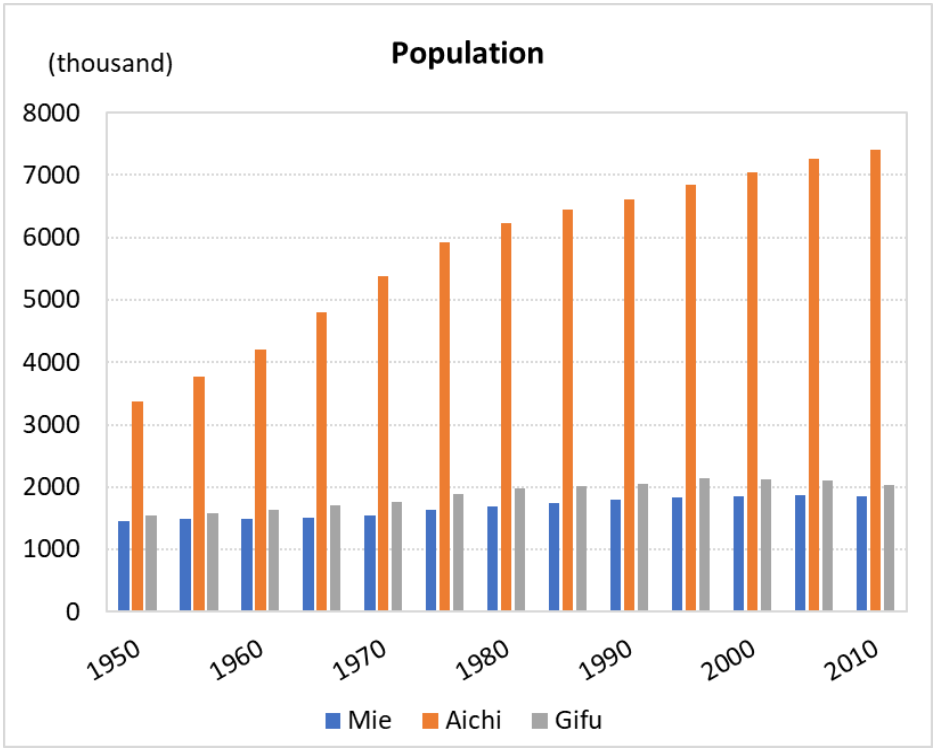
Industrial production in Aichi

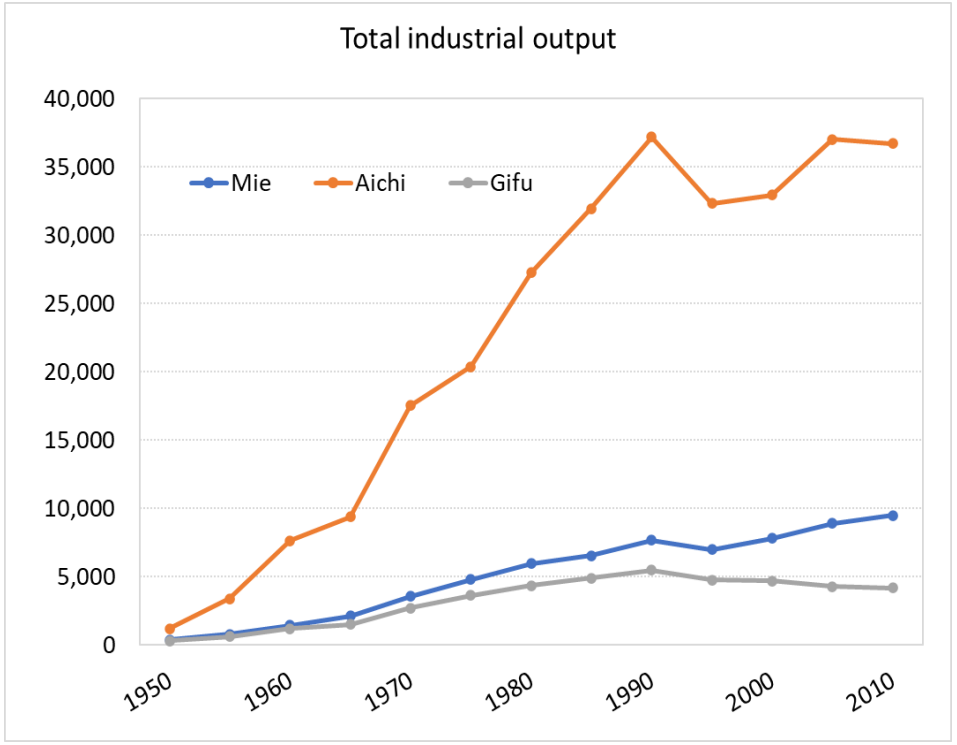


Industrial production in Gifu

Data source: Satoshi Chiba (2021)

Appendix





Data source: Satoshi Chiba (2021)

Thank you very much for your attention!