SALON du LITTORAL
The International Coastal Exhibition, Mediterranean Issue

Satoumi as a unique coastal management system originated in Japan

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(On line presentation)

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Outline of Topics

1. Introduction to *Satoumi* and the Seto Inland Sea
2. Historical changes in ecosystem services of the S.I.S.
3. Recent shift of policies from “passive conservation” to “active conservation” as *Satoumi*
4. Present *Satoumi* activities in Japan and future perspectives
5. Conclusive remarks

What is *Satoumi* ?

- ”*Satoumi*” as a new concept of coastal management was first proposal by Prof. TetsuoYanagi in 1998.
- Outline of “ *Satoumi* ” is a coastal area where biological productivity and biological diversity have increased through human interaction.
  (Ministry of the Environment, Japan).
- Activities to realize bountiful “*Satoumi* ” have gradually expanded due to both change of policy and active participation of local people.



The Seto Inland Sea had been historically blessed with plenty of ecosystem services

The largest enclosed coastal sea and one of the first national parks in Japan.
Area: 23,203 km^2
Coastline: 7,230 km

Mean Depth: 38.0 m, Islands: ca. 700,
East-West: 450 km, North-South: 15~55 km

Historical Change

Provisional services such as food supply of the Seto Inland Sea in the13th century (700-800 y ago) is estimated to be plenty

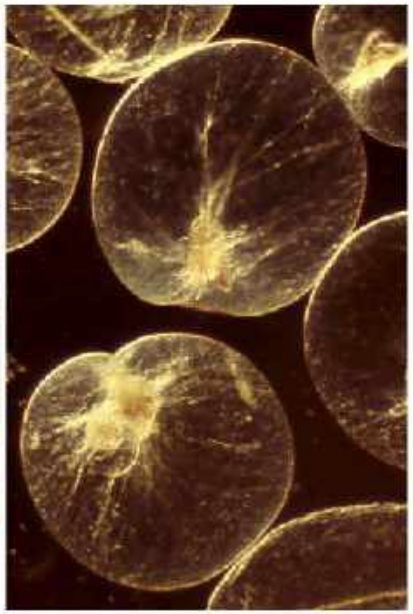
Museum replicas of local fish market based on the evidence of excavation survey. Common products: red sea bream, sea bass, sardine, clam, abalone, sea cucumber and salt.

Display of replica model (Hiroshima Pref. History Museum)

Estimated cultural services of the Seto Inland Sea in the19th century (ca. 150 years ago) was amazing

Ferdinand von Richthofen, a well-known German geographer who named “Silk Road” (Seidenstrassen) visited the sea in 1860 and highly evaluated the scenic beauty and praised peaceful landscape as “almost heaven”.

He prayed the eternity of the beautiful sea. But at the same time, he worried about extreme development of civilization and endless desire of human being in the coming future.



Red Tide caused by *Noctiluca scintillans*
occurred in Seto Inland Sea, Japan (May 6, 1976)

WESTPAC-HAB R0002

Richthofen's worry came true just after 100 years. The beautiful and rich Seto Inland Sea collapsed during late 1960s to 70s and was called "Dying Sea". **Various ecosystem services drastically destructed.** Special law "Seto Inland Sea Law" was enacted in 1973, 47 years ago.

Mass mortality of yellow tail caused by red tide

“Seto Inland Sea Law“ * was enacted in 1973

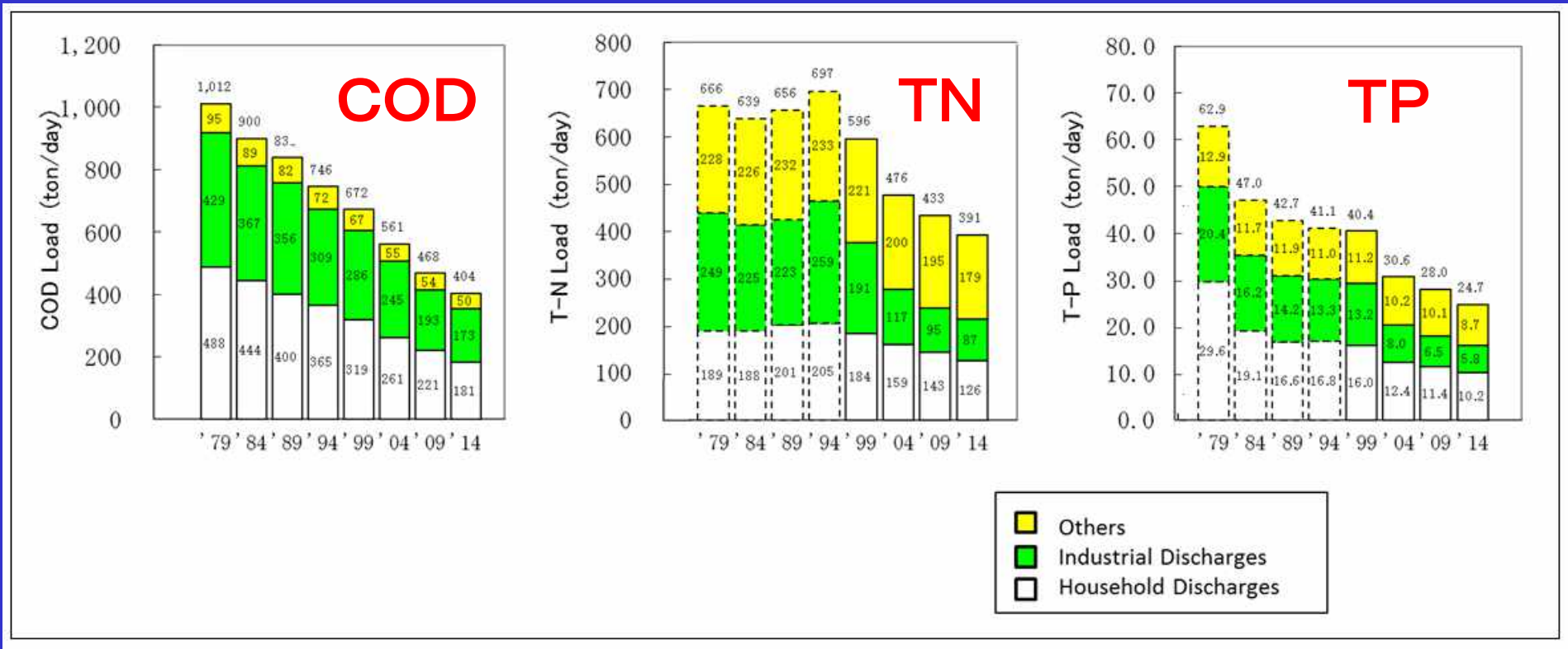
* Law Concerning Special Measures for Conservation of the Environment of the Seto Inland Sea

Two major original functions of the law

1. Area wide total pollution load control (TPLC) :Stop discharge !
   TPLC in terms of COD, Total Nitrogen (TN) and Total Phosphorus (TP) has played an important role on the improvement of water quality.
2. Suppression of land reclamation (landfill) :Decrease landfill !
   Effect was restricted because the law did not order total ban of land reclamation.

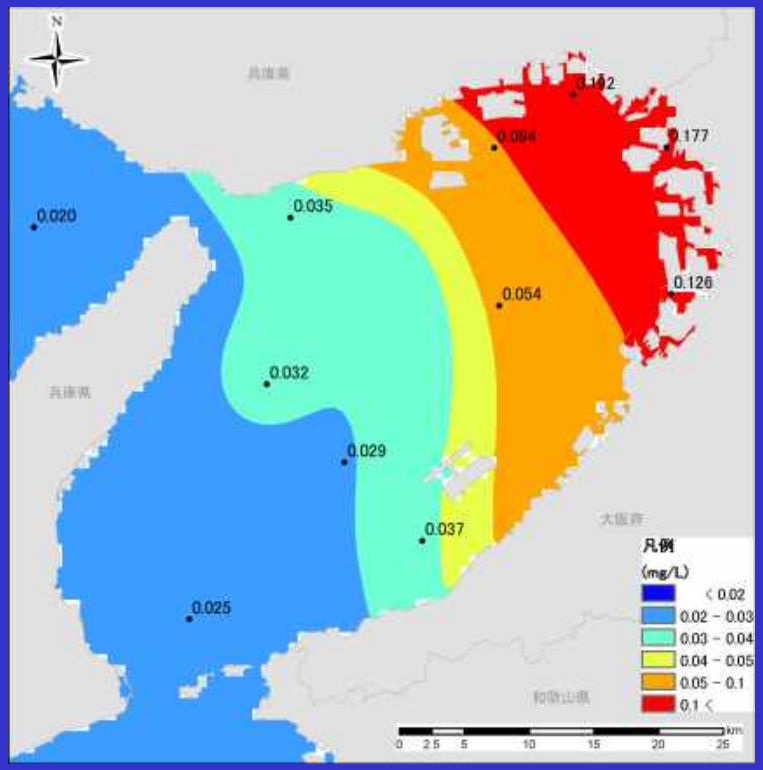
Both measures were preventive “passive conservation”

TPLC (COD, TN, TP) has been quite successful during the last 35 years

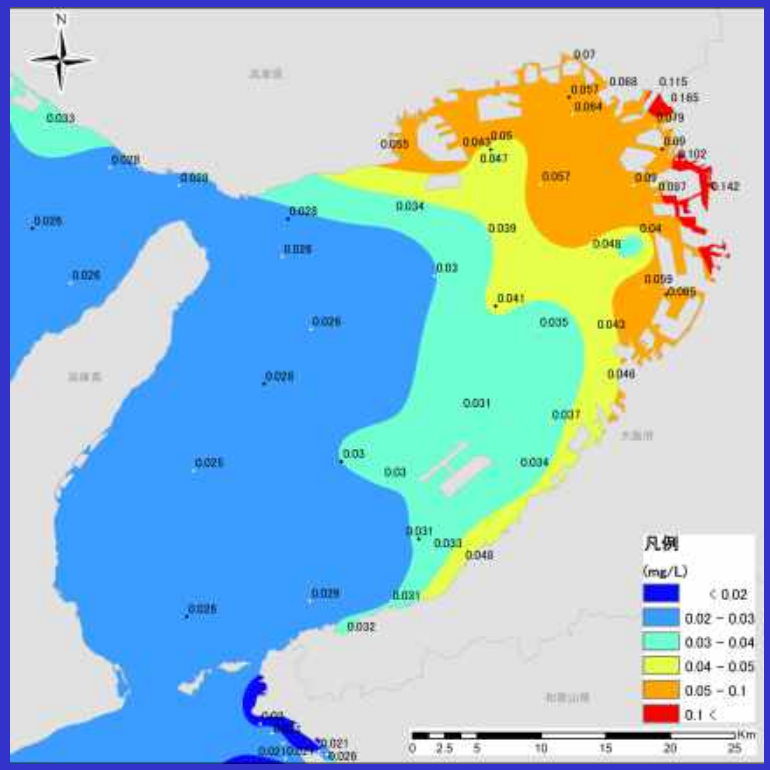


Trend of Pollutant Load in the Seto Inland Sea decreased (1979-2014)

Water quality improved by TPLC
Change of water quality (TP) in Osaka Bay



Average of FY1982-1984

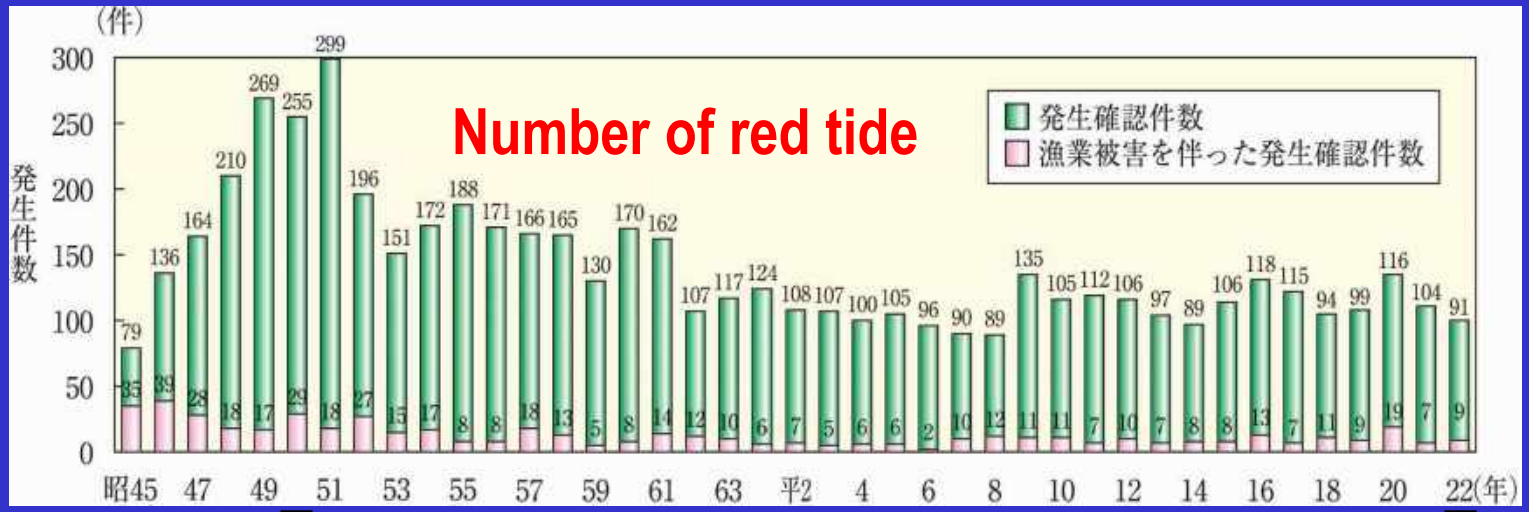


Average of FY2009-2012

Comparison of TP concentration in sea water (MOE)

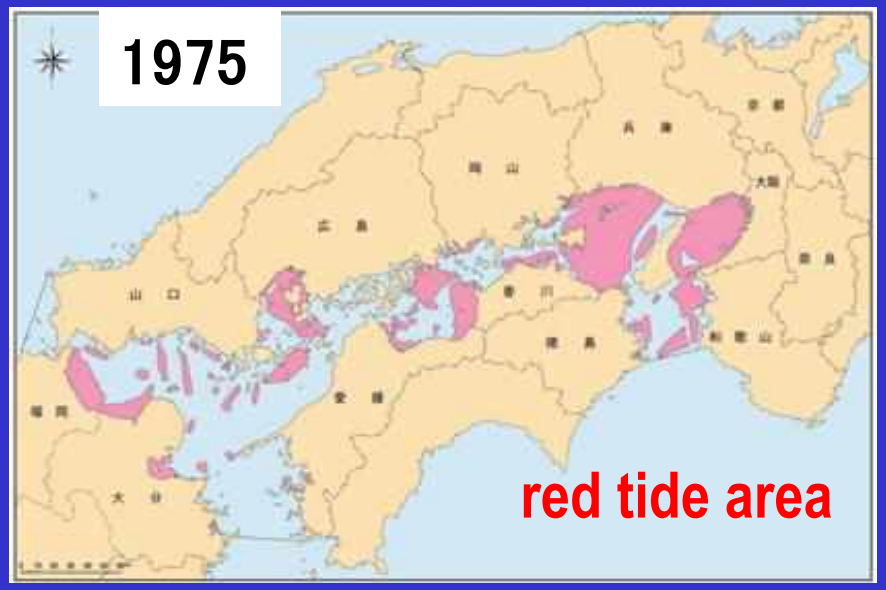
Red tide occurrence decreased by TPLC

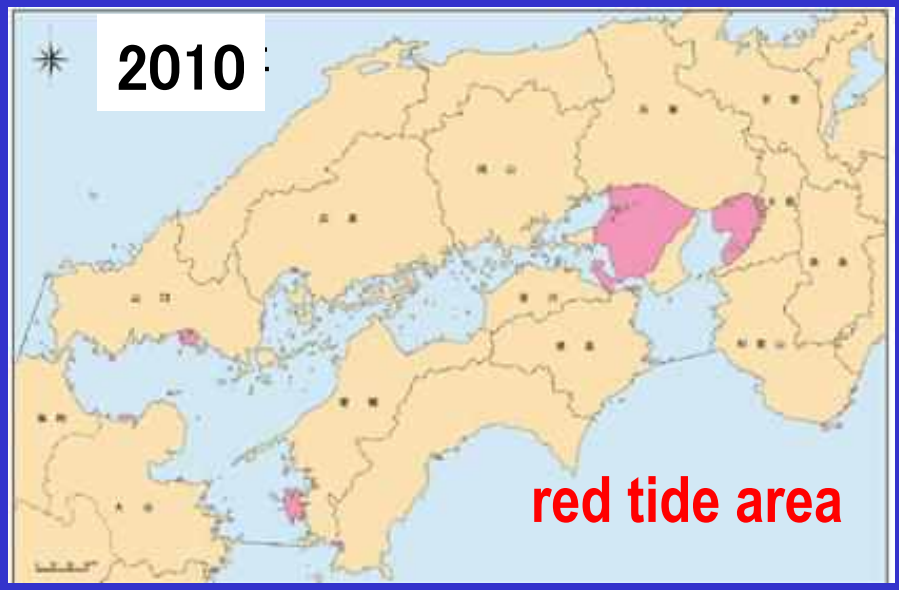
NO/y



1970

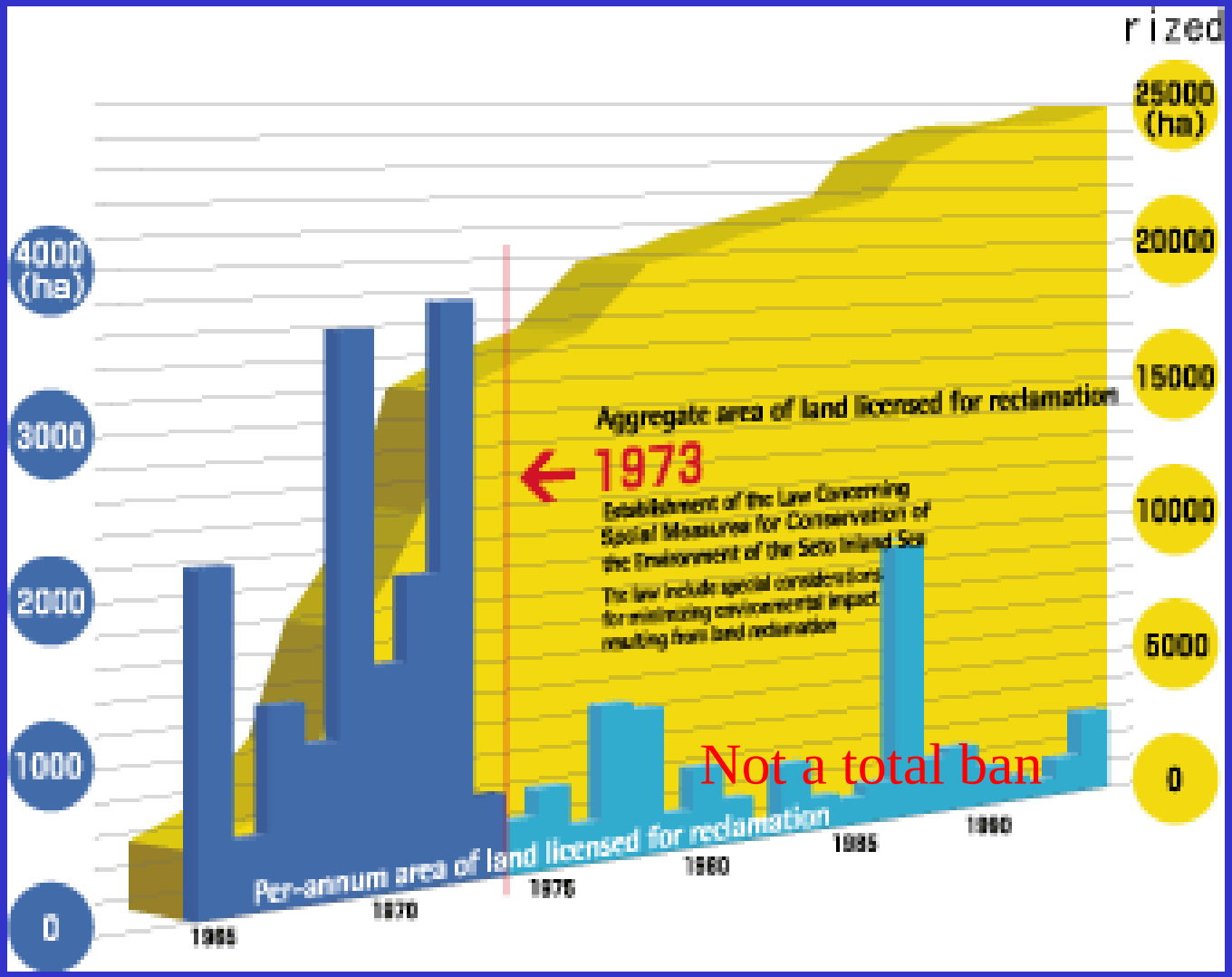
2010





(The Association for the Environmental Conservation of the Seto Inland Sea)

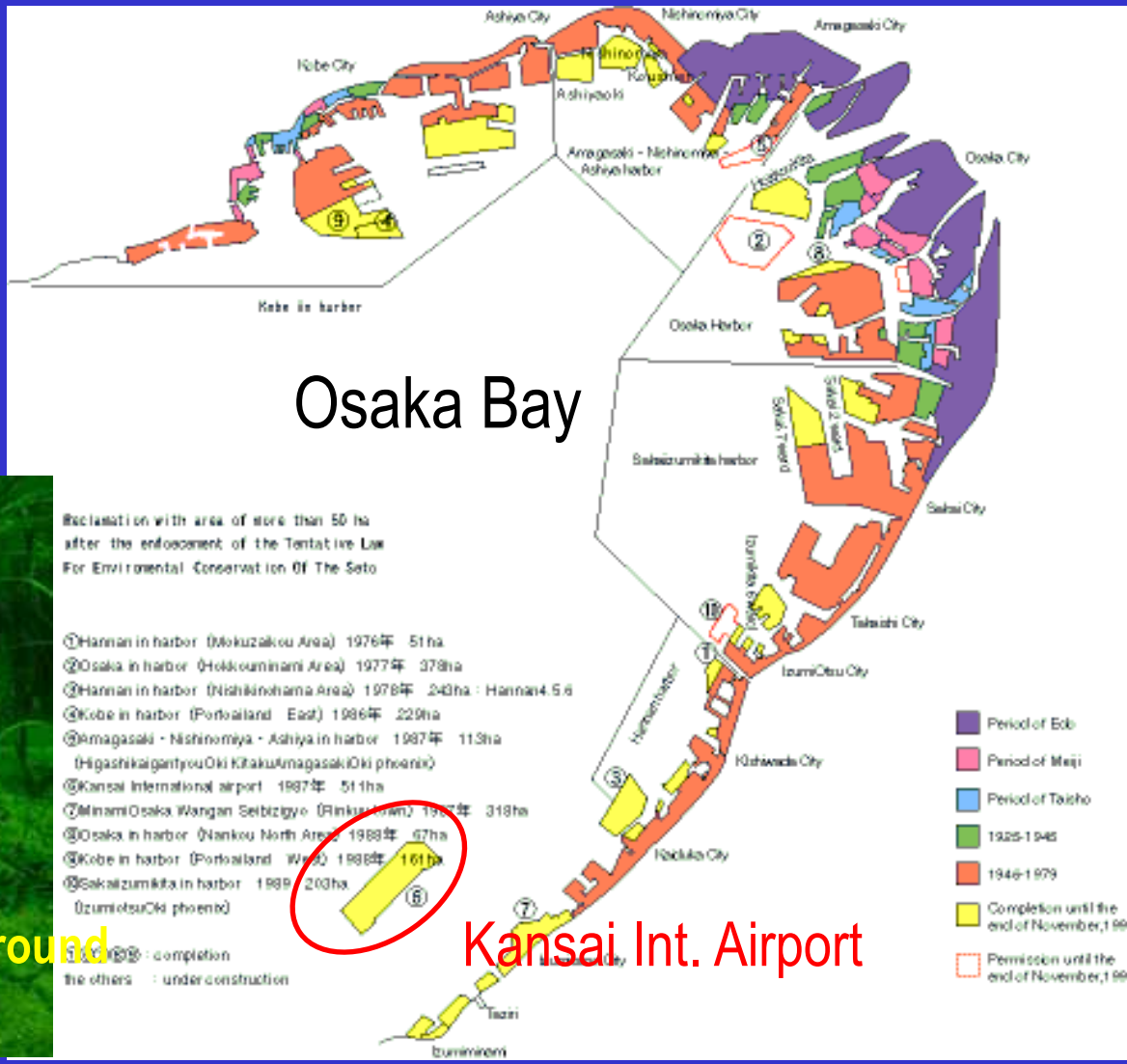
However, effect of suppressive policy on landfill was limited



Changes in the area of land reclamation

Result of historical land reclamation in Osaka Bay

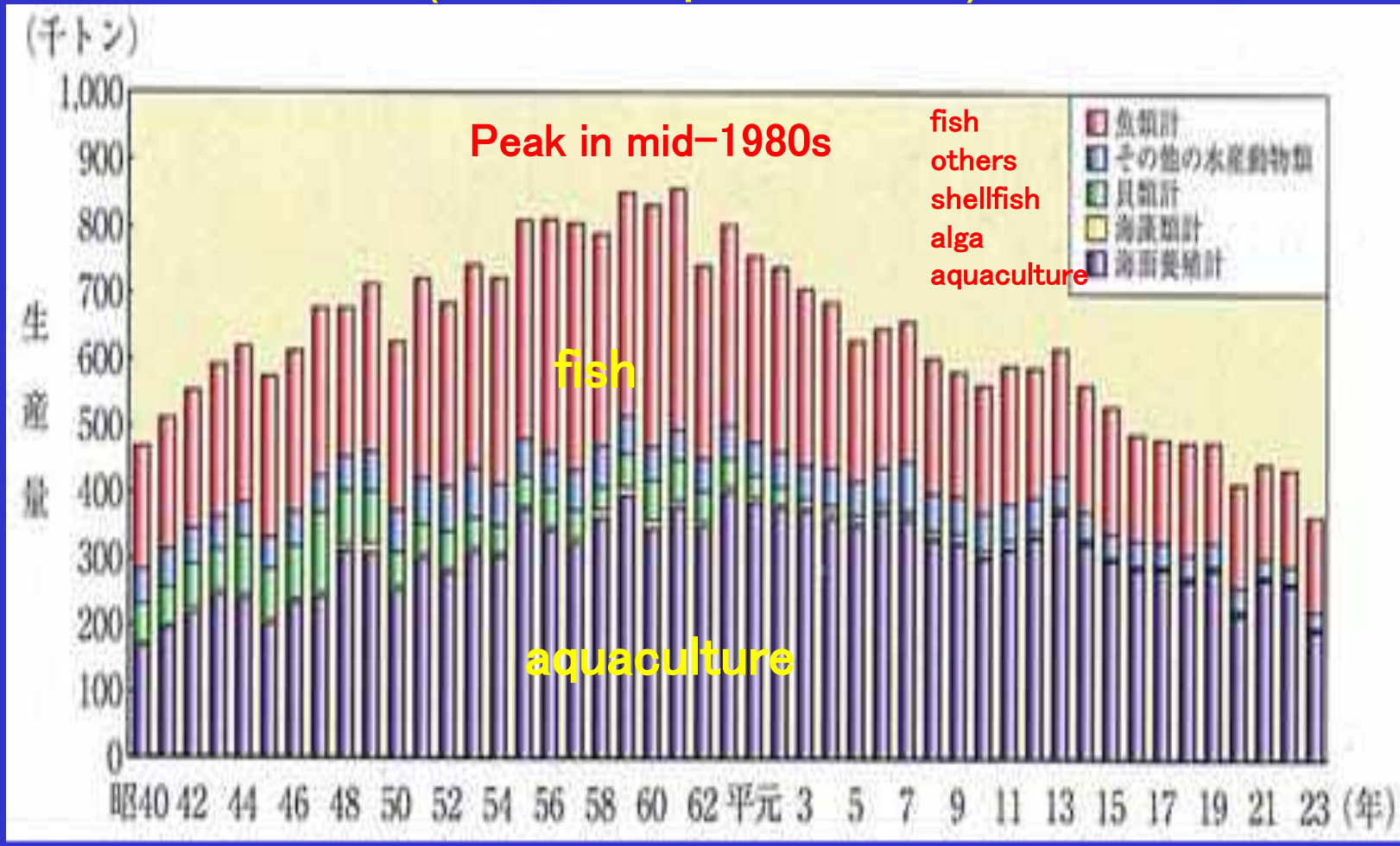
Water quality has been improved by TPLC. However, ecosystem services by natural sea shore extremely declined by coastal development.



Tidal flat and sea grass bed disappeared. No natural sea shore at all.

Provisional services (fisheries production) declined

thousand ton



1965

2013

Total production (2012): ca. 380,000 ton

(fish catch: ca. 170,000 ton, aquaculture: ca. 210,000 ton)

Major aquaculture: oyster 65%, laver 21%

(SECA, 2015)

Supporting services (biodiversity) extremely decreased

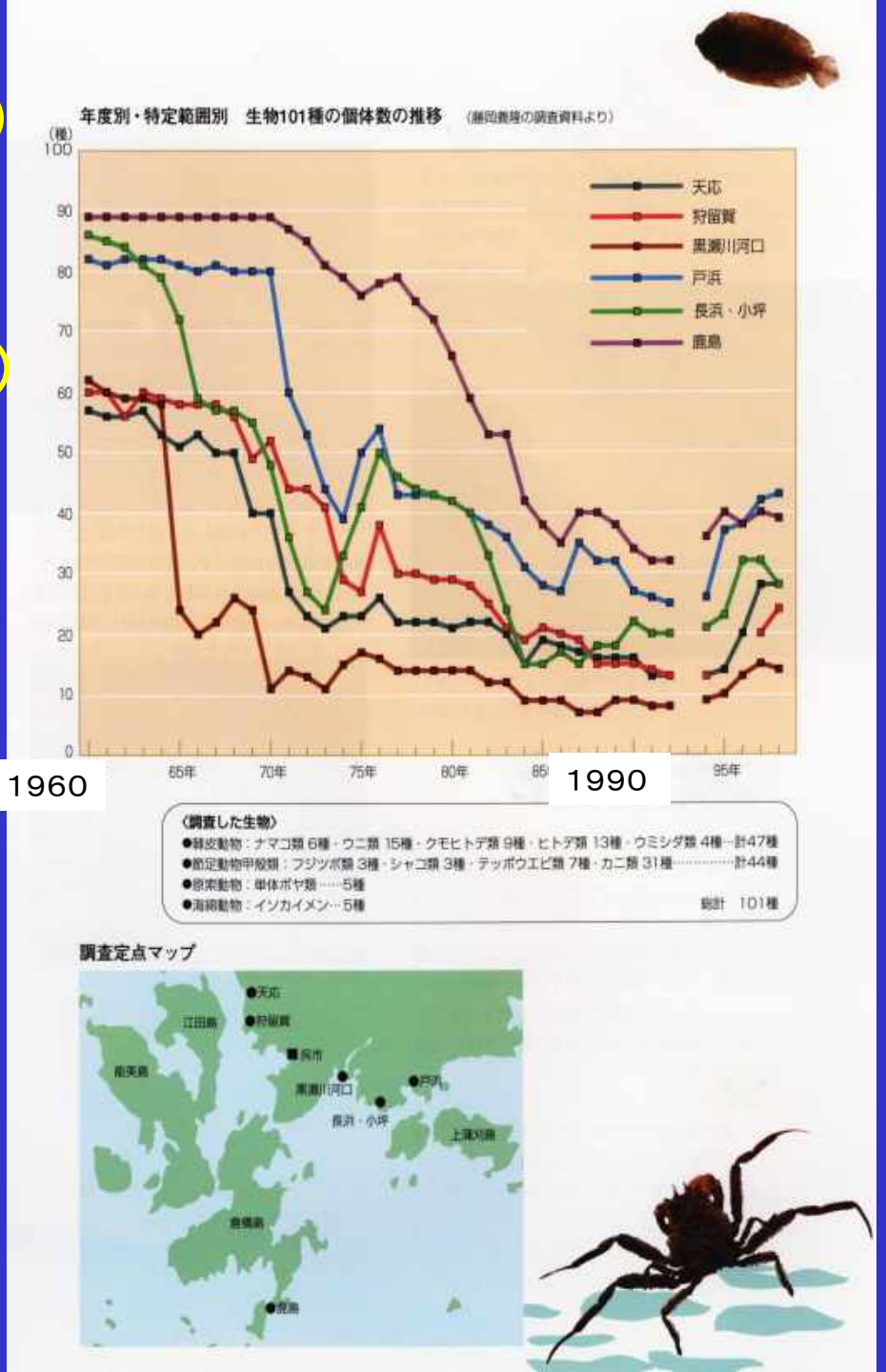
Monitoring results at Kure area (no systematic data are available)

800 sp. of flora and 3400 sp. of fauna

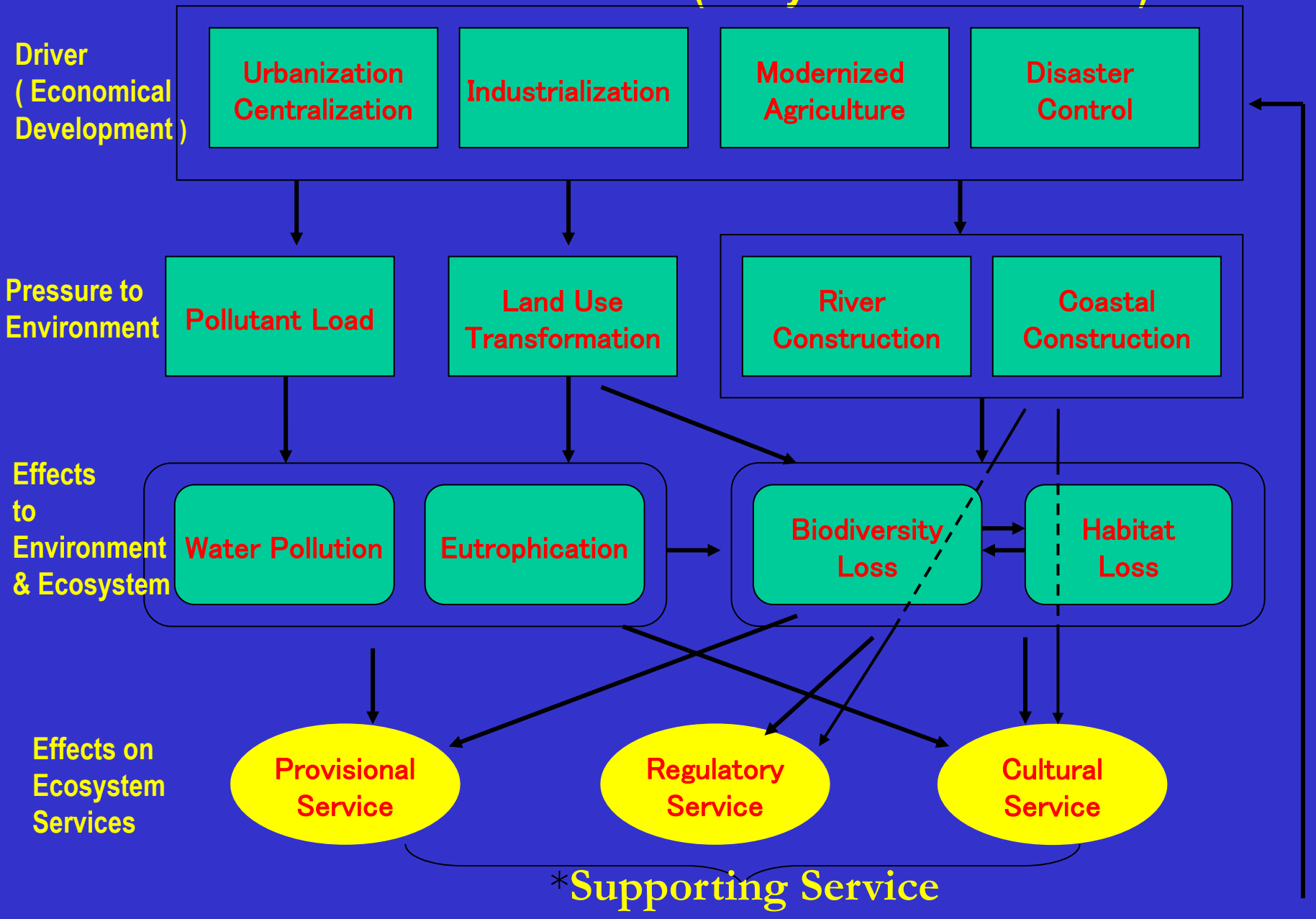
1. From mid 1960s
   Rapid decrease of species number and population of shore animals.
   Decrease of biodiversity and biological productivity.
   Deterioration of habitat condition.

2. From mid 1990s
   Species number is a little increasing but still far below the level of 1960s.

(Yuasa)



Inter-linkage between environmental changes and ecosystem services in the Seto Inland Sea (*Satoyama-Satoumi* SGA)



Lessons learned from the history of the Seto I. Sea

1. Some problems can be solved by “passive conservation”. However, not all problems can be solved only by “passive conservation”.

2. Not only “passive conservation” but also “active conservation” such as *Satoumi* is now very important.

3. Since cause–effect relationship of the present issue is so complicated, not only single issue approach is enough. Therefore, “integrated holistic approach” is necessary.

Recent conceptual shift of the management policies in the Seto Inland Sea

Passive conservation such as:

Total Pollution Load Control (Stop excessive discharge !)

Suppression of land reclamation (Decrease landfill !)

Active conservation (*Satoumi*) such as:

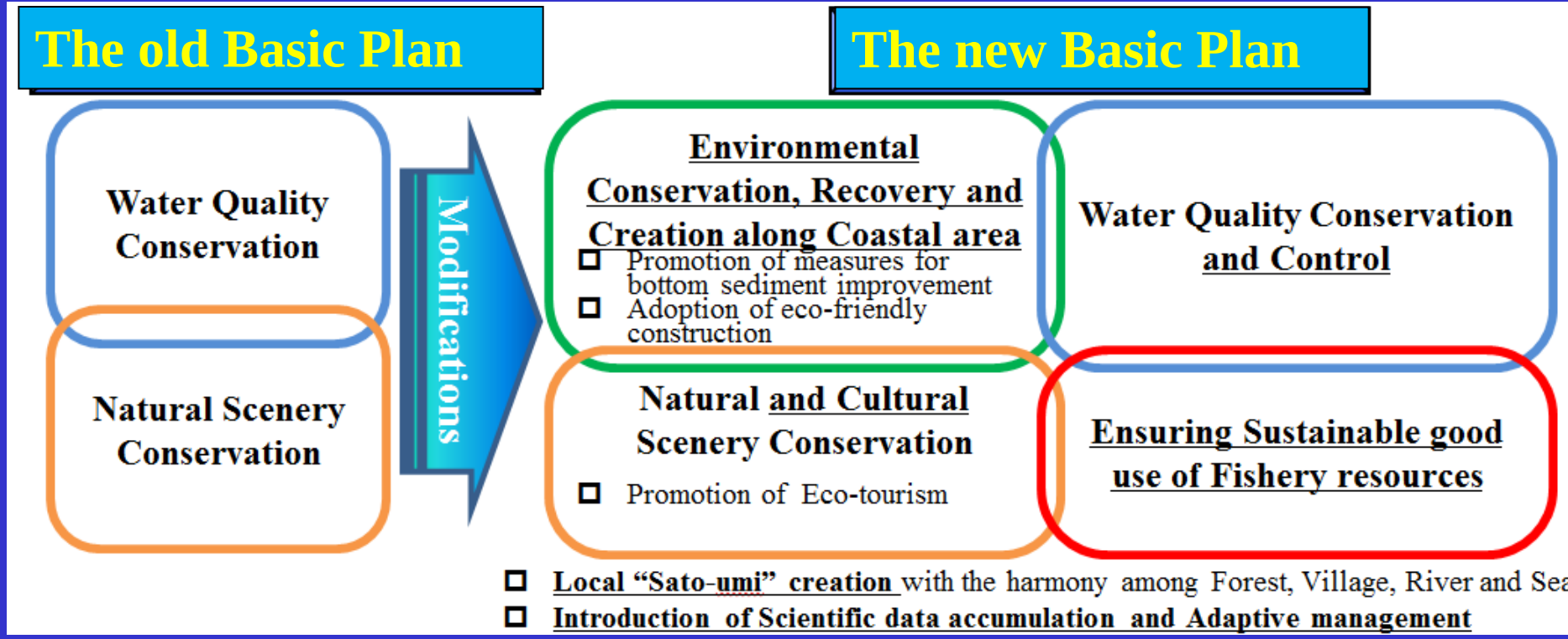
Restoration of biodiversity, biological productivity, habitat and well balanced nutrient cycle between land and sea. (Restore tidal flat !, Improve sea grass bed !)

Single issue approach such as: water quality control

Holistic approach such as: EBM, ICM and *Satoumi* including adaptive management

"The Seto Inland Sea Law" and basic plan were revised in 2015

Point of recent revision of the Basic Plan (MOE)



Simplified major change of the aim:

water quality control → Restoration of biological habitat, diversity and productivity

(abundant and bountiful sea, *Satoumi*)

Present *Satoumi* Activities

Kagawa Prefecture established new *Satoumi* Vision in 2013

Kagawa's Vision for the Creation of *Satoumi*

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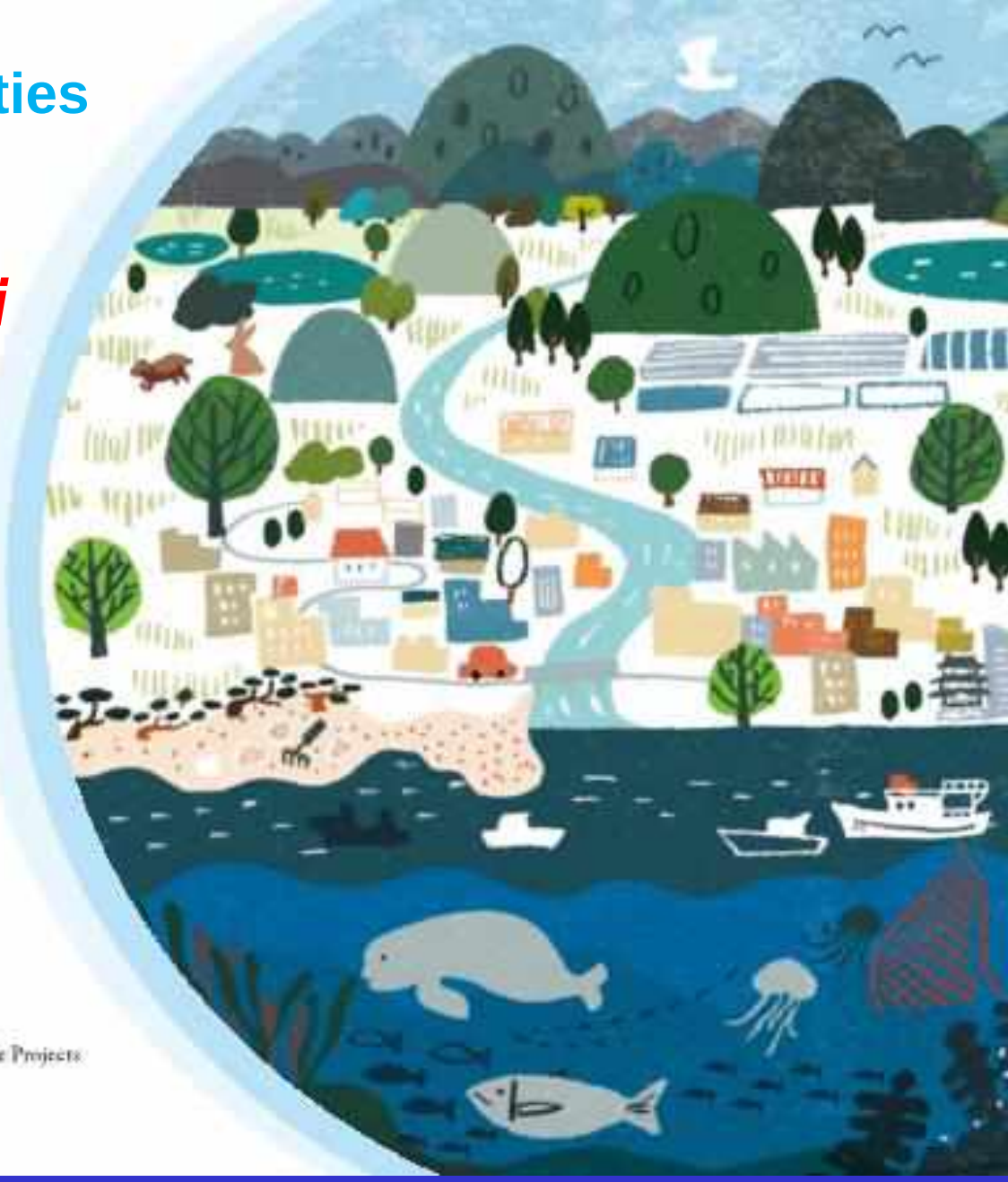
1. Introduction to *Satoumi*: Why Now?
2. Purpose: Objectives of the Vision
3. Current Status and Issues: Changes in the Seas of Kagawa
4. Approach to the Creation of the Ideal *Satoumi* for Kagawa
5. Directions for the Project: (1) Characteristics of *Satoumi*
   (2) Six Key Points for Carrying Out the Projects



Activities of local government on *Satoumi*

3. To Connect

Through *Satoumi*, we are reconstructing our relationship with the sea from the two perspectives of *people* and *nature*.

Connections with *Nature*

Nutrients* and organic substances contained in water from mountains, agricultural fields, plants, and households are transported by rivers to the sea, and return to us through the food chain. We are working to create a healthier sea by considering these connections with nature (the material cycling).

*"Nutrients" refers to nitrogen, phosphorus, and other substances necessary for plant life.

Connections with *People*

We are cooperating in projects focused on the mountains, rivers, towns and cities, and the sea, and are evaluating the results comprehensively for the area as a whole.

Land-ocean interaction within nature Land-ocean interaction within people

Activities of local government on *Satoumi*

Satoumi policy of Kagawa Prefecture is promoting eco-tourism, environmental education and marine litter processing


Case of Bizen City,
Okayama Prefecture
Fishermen of Hinase area are very active for sea grass bed restoration (83 members): Many groups joined this activities.

Local people continued restoration activities of sea grass bed more than 30 years

Almost disappeared in 1985

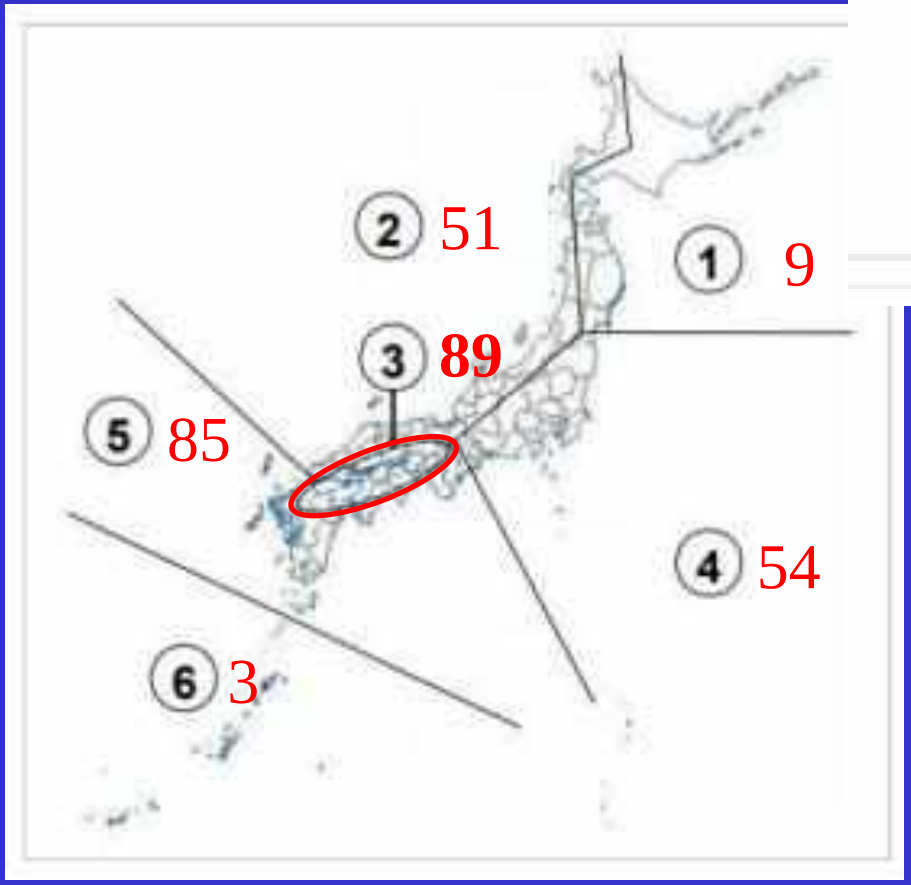
Recovered up to about 1/3 of 1946-1954 in 2013

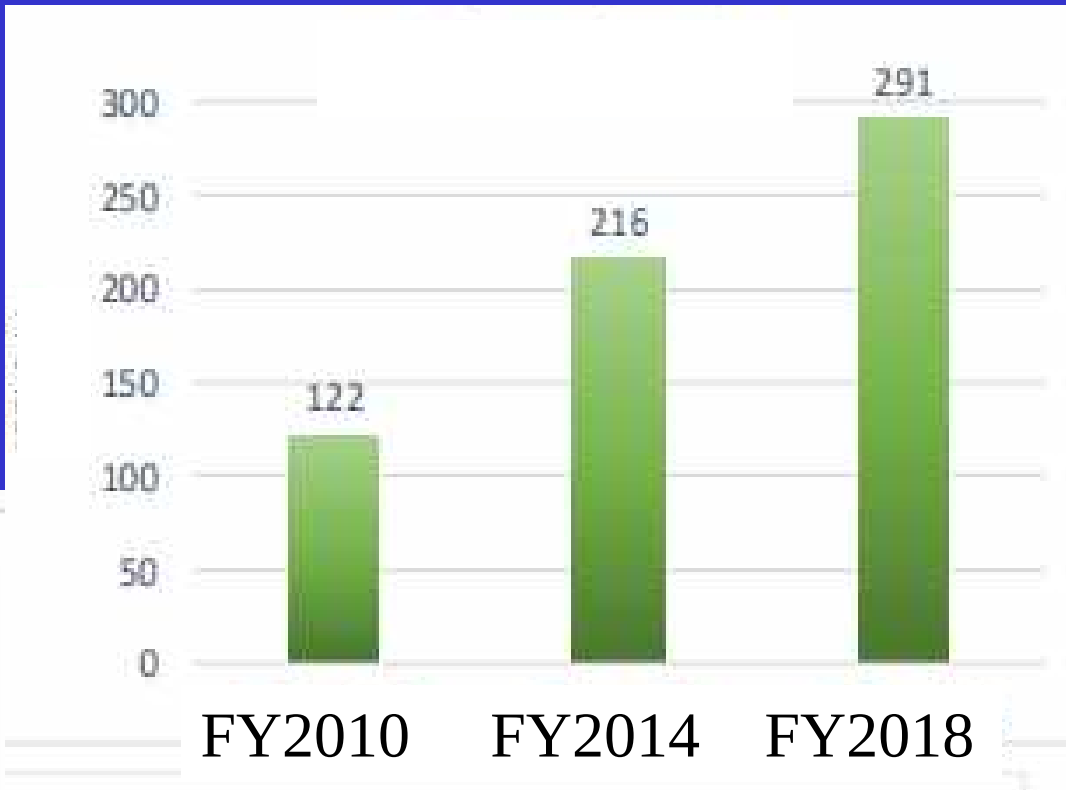
"Gomino-ichi"

Restored sea grass bed contributed to improve ecosystem services such as provisional service

On site fisherman's local sea food market "*Gomino-ichi* (5 tastes market)"

Satoumi activities are increasing in Japan, and most active in the Seto Inland Sea





Change in the number of *Satoumi* activities in Japan

Number of *Satoumi* activity site in FY2018 (MOE)

Aim of *Satoumi* activities as Ecosystem Services

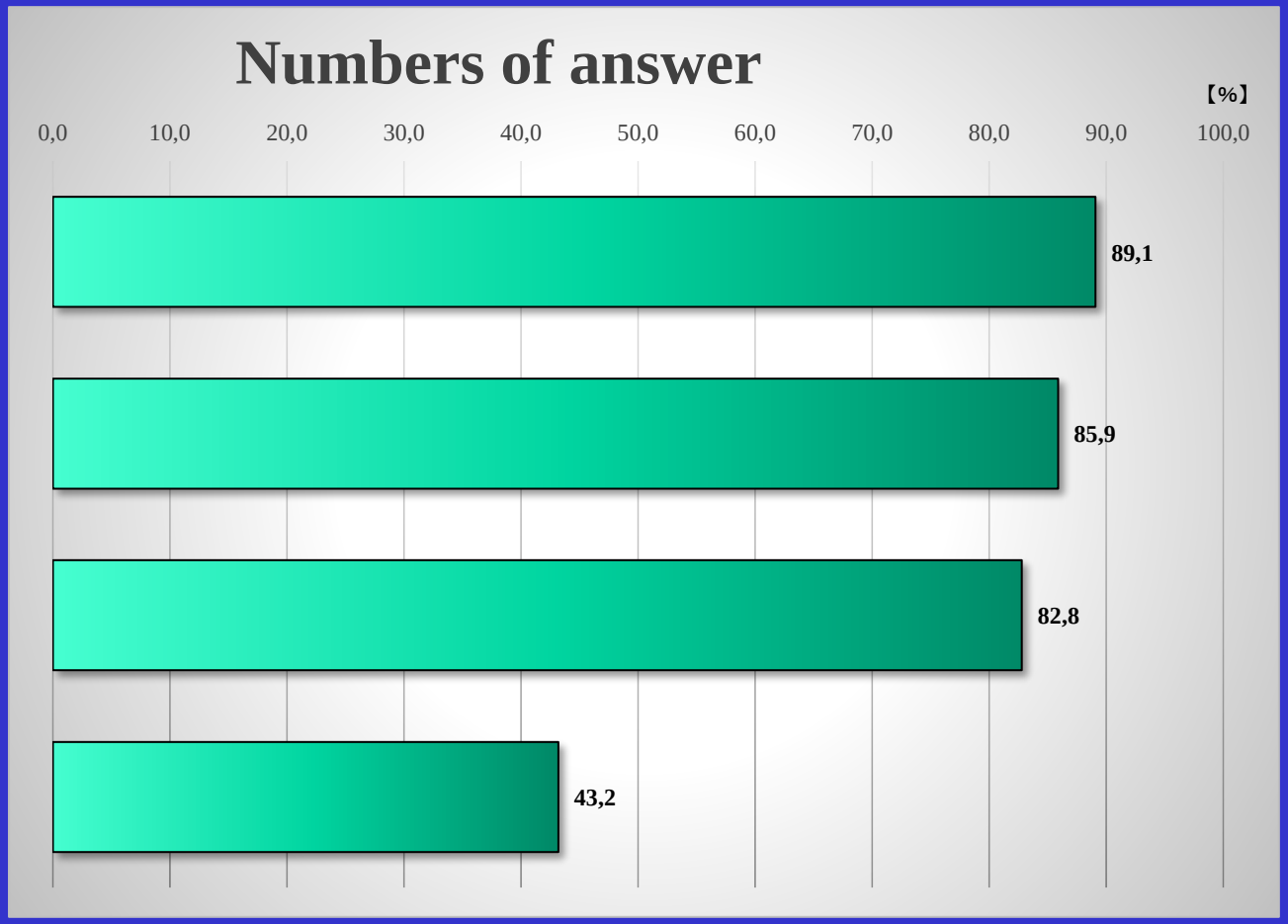
Category:

Basic, Supportive

Regulatory

Provisional

Cultural



What are objectives of *Satoumi* activities ?
(Numbers of answer: 192, MOE 2015)

Conclusive Remarks

In many deteriorated enclosed coastal seas, only “passive (preventive) conservation” is not enough for sustainable use of coastal resources but “active conservation” with human interaction is necessary.

Among many types of “active conservation”, *Satoumi,* community-based “active conservation” with people’s participation, is vital to realize resilient coastal seas and to reconstruct better relationship between human and the sea.

SDGs

Adopted by all 193 nations of UN in September, 2015

(United Nations Information Centre)


For sustainable use and development of coastal resources, *Satoumi* as "active conservation" can promote maximization of ecosystem services toward SDGs-based human well-being
Resilient coastal seas for next generation !
Thank you for your attention!