

# A story of the successful application of a co-management fishing regime in Suruga Bay, Japan

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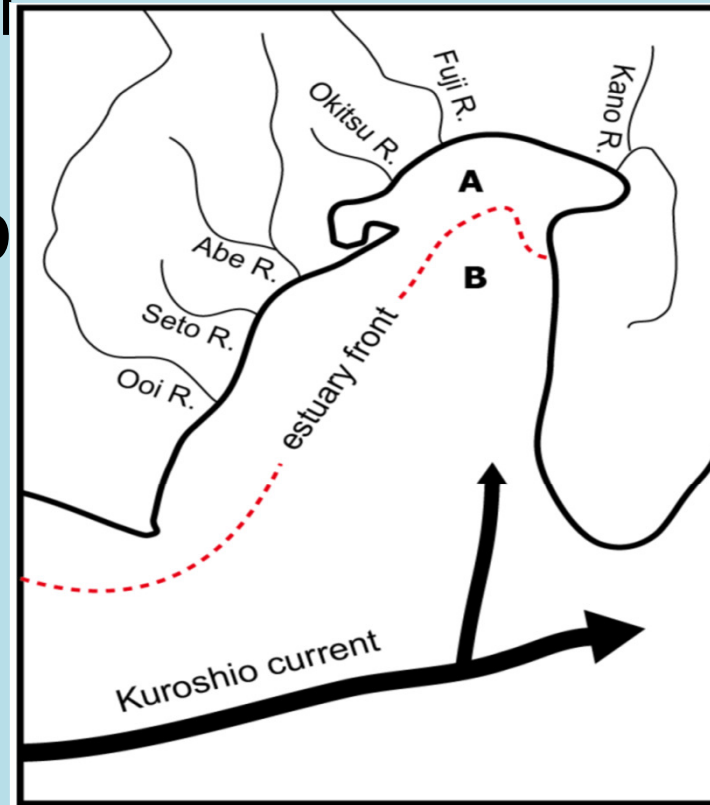


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1. What is sakura-ebi  
(a sergestid shrimp)?

- In 1894, two fishermen from Yui town happened to discover sakura-ebi.
- Ever since that discovery of shrimp in the deep waters, sakura-ebi fishing has thrived in three districts, Yui, Kanbara, and Ooigawa.



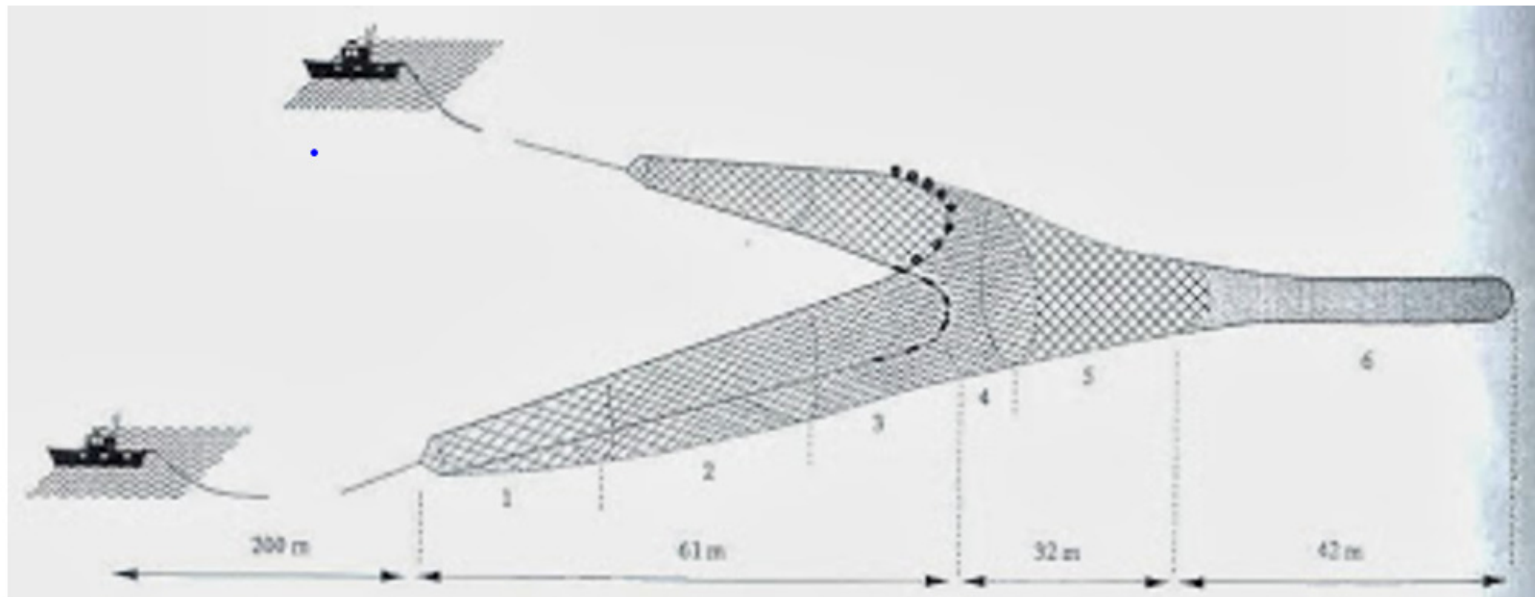
## Biology and fishery of Sakura-ebi

- Sakura-ebi scatter widely between 200m and 350m near the bottom on during the day. In the night, they begin to aggregate and ascend to a depth of about 20–50m.
- Fishing is conducted in the night.

## In Japan, Fishery Cooperative Association (FCA) plays a central role for coastal fishery

- Allocates to individual fishermen the legal rights to fish certain stocks and resources.
- Responsible for the management and conservation of the fish resources in the jurisdiction.
- Sakura–ebi fishing is conducted by 3 (2 today) FCAs (Ooigawa, Yui–port, and Kanbara), issuing 120 fishing rights.

- Fishermen use the paired trawling system, in which two vessels tow a single net stretched between them.
- 60 units (120 vessels) are engaged in sakura-ebi fishing.
- The fishing season is divided into the spring season and the fall season.



<http://yamatosyokuhin.blogspot.ru/2013/10/blog-post.html>



Sakura-ebi is used for various foods as well-know local brand.



# Local Processors

- All the sakura-ebi are sold to a number of local processors.
  - There are 70 processors today.
- The processors' revenues depend heavily on Suruga Bay's shrimp catch, though Taiwanese shrimps are available (discovered in 1988).



# A Scene from the auction



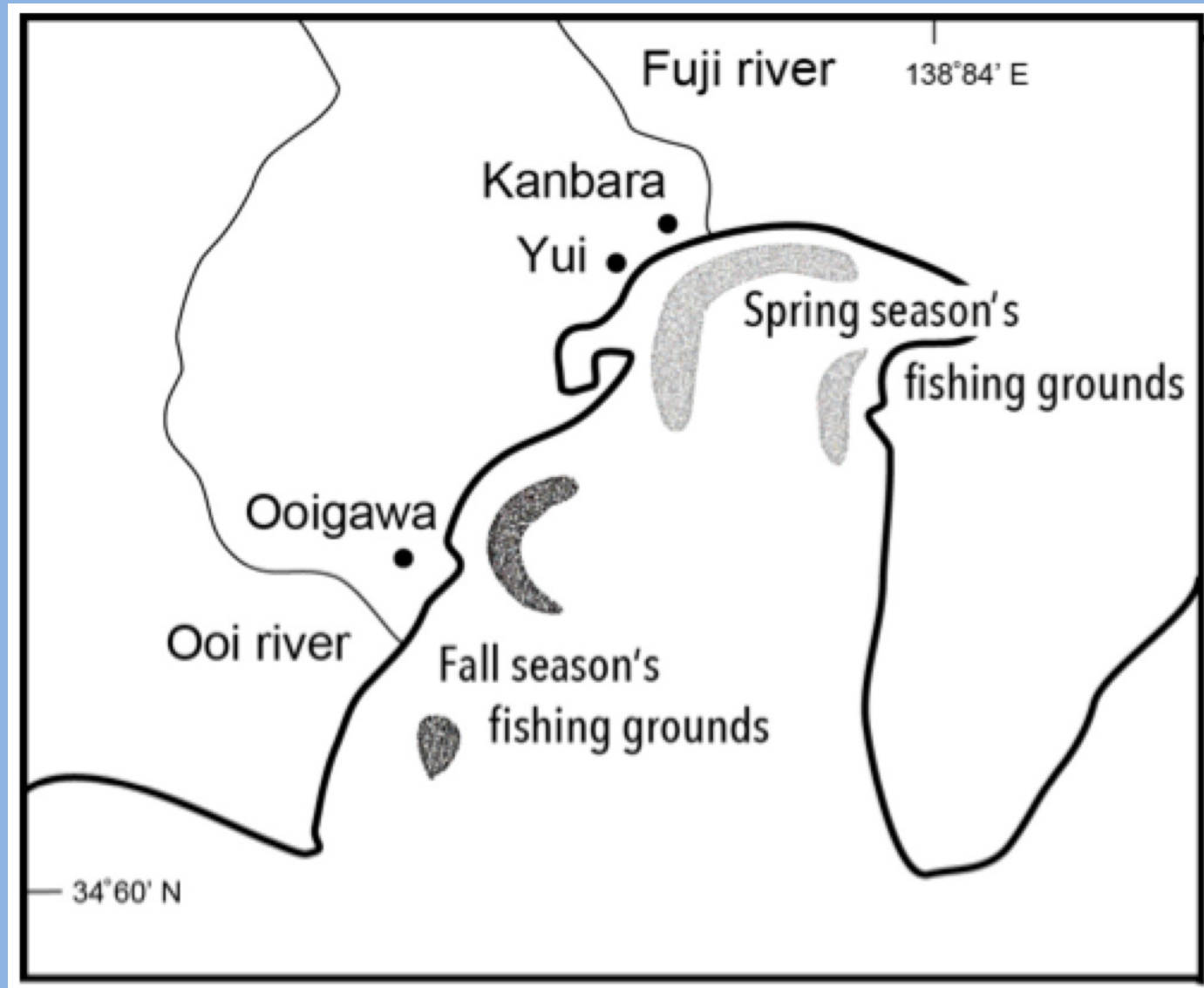


# Drying Sakura-ebi



## 2. History of fishing in Suruga- bay

# Fishing ground of Sakura-ebi is narrow and limited

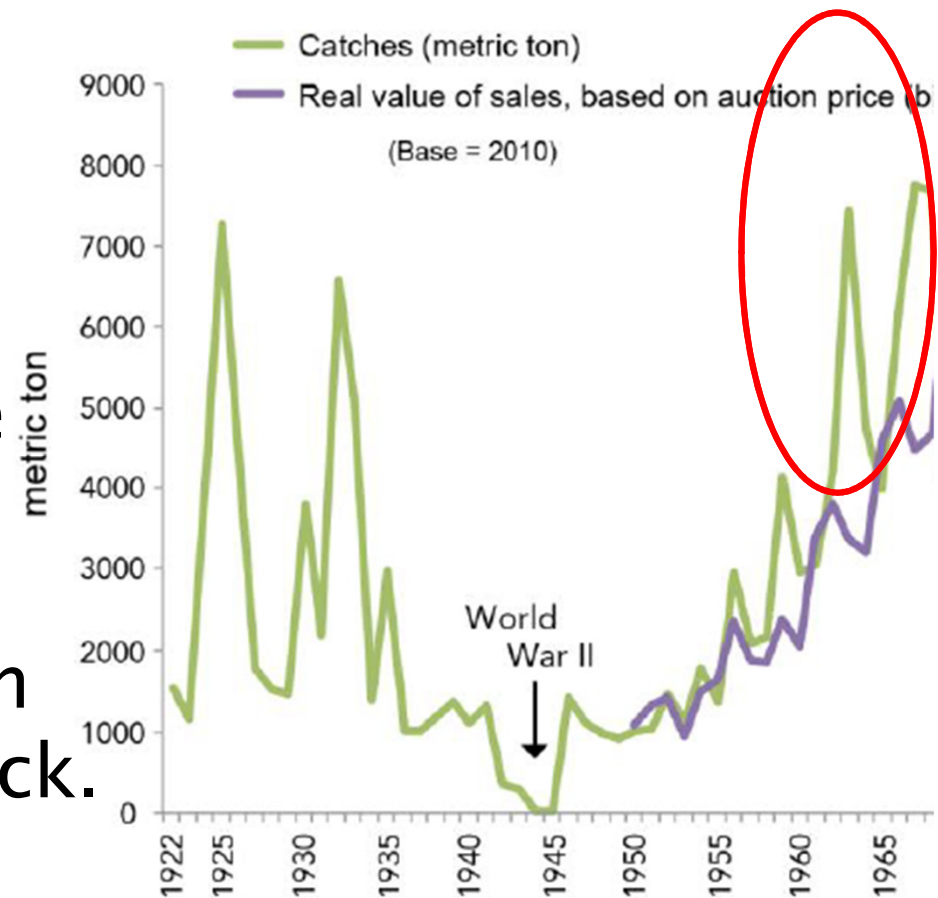


## Operations in this fishery closely resembled the Darby race until 1960s

- All of the fishing vessels often led to intense competition for catches, which caused disputes between fishing vessels and overfishing.
- Processing of the shrimps by sun drying is affected by the weather, and only a limited quantity could be processed in one day.
- As a result, when the catch exceeded that quantity, the auction price dropped dramatically.

# The crisis came in 1960s

- The catch continued to increase after 1945, until 1960s when the catch dropped dramatically.
- Fishing grounds were polluted by effluent from paper mills.
- There arose a concern over the resource stock.





### 3. Pool Arrangement (PA)

Pool Arrangement (PA) was introduced in 1968, in each of the three districts, unified later in 1977.

- PA is to share equally the total catch revenues among all vessels, regardless of catch of each vessels.
- The PA is intended to provide
  - improved resource management of sakura-ebi by stopping overfishing
  - stabilization of sakura-ebi price through production control

# Present sharing system

- After market handling fee (5%), the total revenue is equally divided among 120 vessels. Each revenue is then divided among the crews and vessel owners in a 50/50 ratio.
- In dividing each crew's share among its members, each skipper and engineer receives 20 percent more than a regular crew member receives.
  - Each vessel has a skipper, an engineer and 4 crews.

# Fishing rule under PA

- The FCAs created a committee named *the Board for the Countermeasures for the Fishery* (BCF).
  - Composed of two vessel owners and five skippers from each of three FCAs.
- The 21 members of the BCF meet every day during the fishing season to decide on the details of the fishing activities.
  - fishing ground, departure time, operating hours and target catch sizes.

## Fishing under PA (cont.)

- Owing to the BCF's directives, the 60 units (120 vessels) are often divided into four parties and only specified parties are allowed to cast their nets, while the other parties wait for their turn in the fishery.

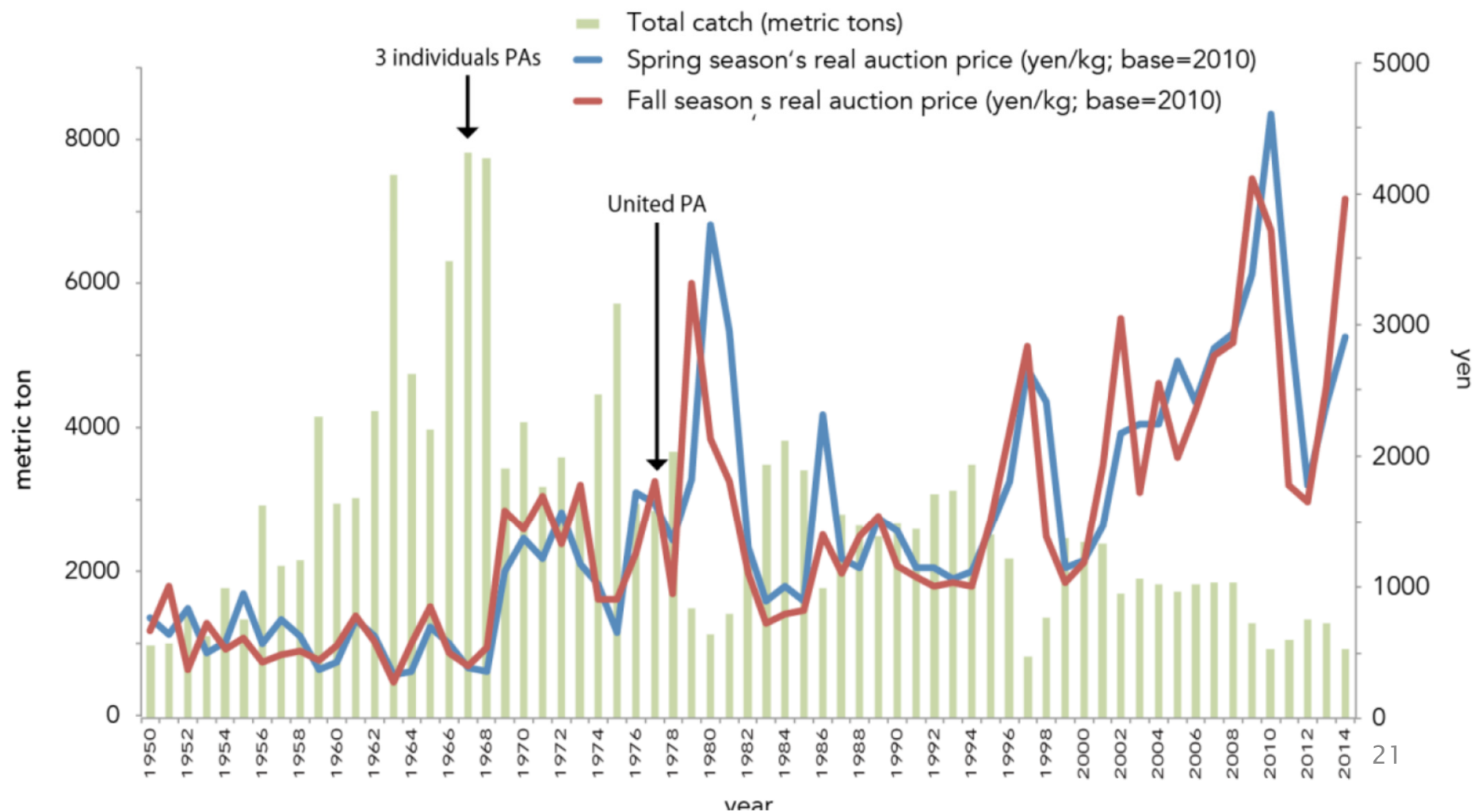
# Contributions of PA

- Stopping overfishing by reducing fishing days.
  - from 67–108 days (1955–1964) to 25–41 days (2005–2014).
- Maintaining or even increasing total revenue in spite of less catches.

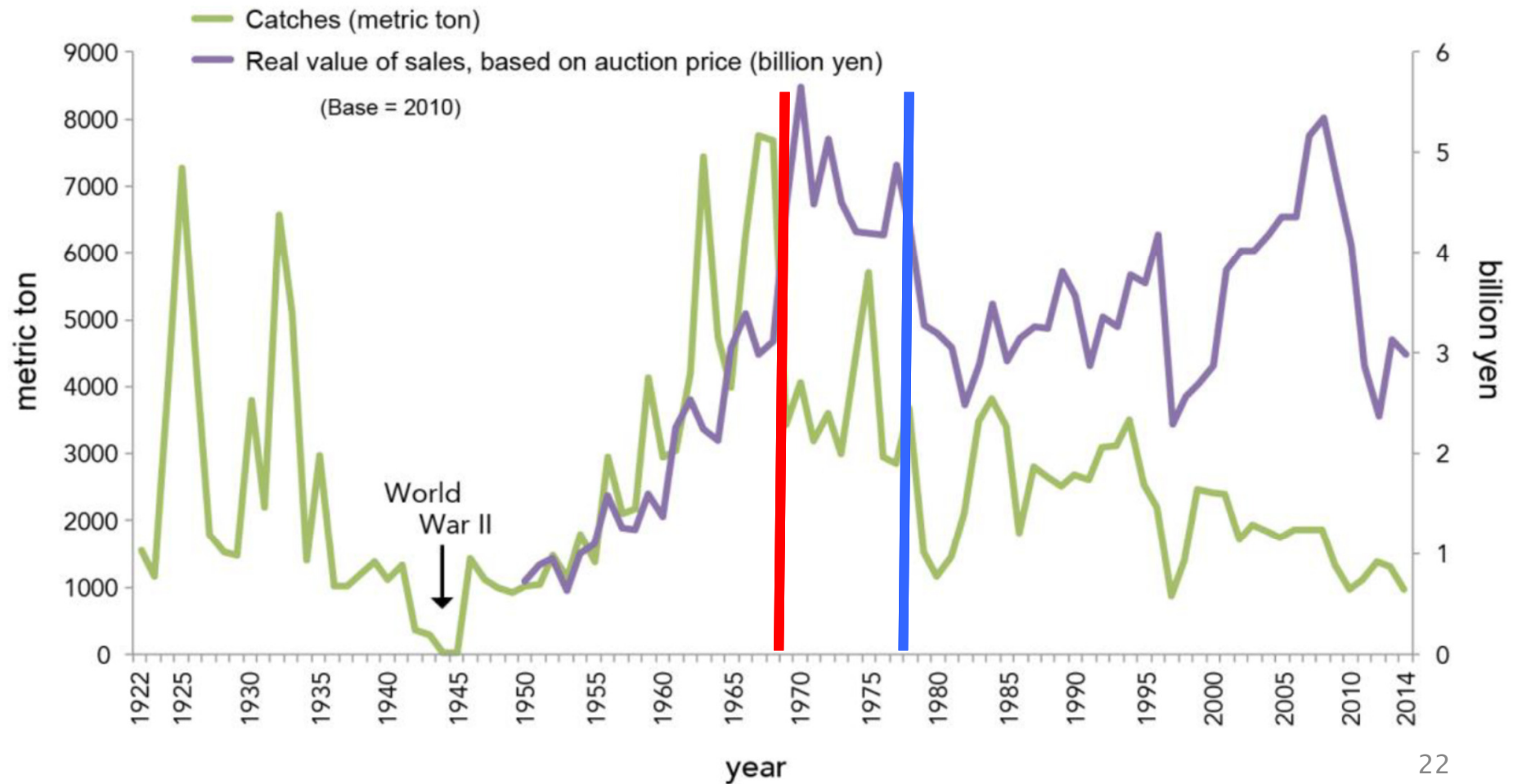
As a result, the districts was recovered from the economic and resource crisis.



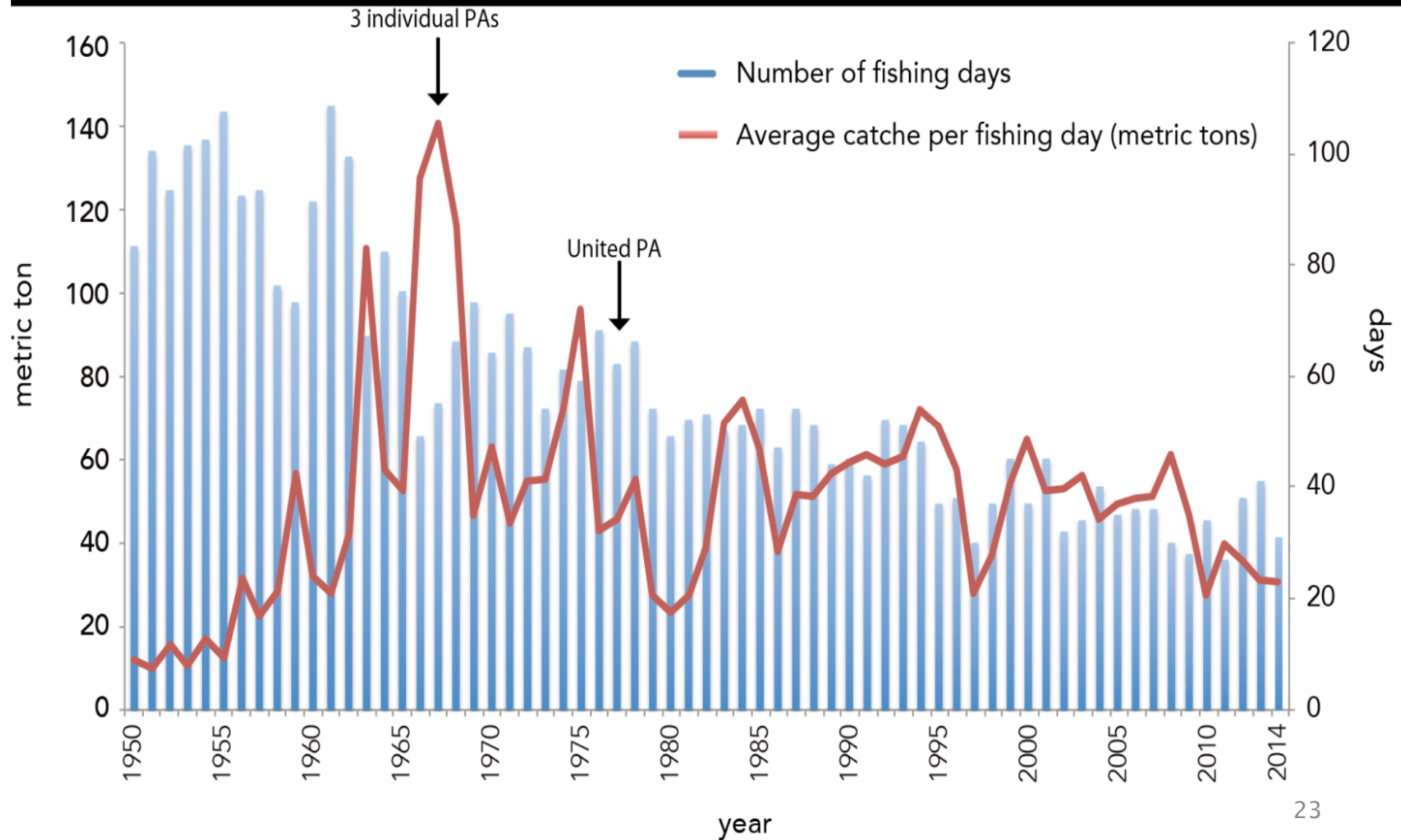
# Catches and the prices



# Catches and the revenues



# Fishing days and average catch



## 4. Significances of PA

# Adaptive management is implemented

- Fishing resource conservation requires prompt control of the catch when necessary.
  - Adaptive management
- Such control usually requires a high transaction cost.
- The cost is interpreted as
  1. the difficulty of coming to an agreement among fishermen about the target catch
  2. the difficulty of agreement on the allocation of the costs and benefits among fishermen.

## Ostrom (1990) points out the importance of transaction Cost

- Transaction cost is crucial for successful communal management of natural resources.
- Ostrom suggested, transaction cost depends largely on the fairness of allocating the costs (burdens) and benefits (profits) among the stakeholders.
  - If the members of the community do not regard the allocation as fair, the transaction cost for the members to arrive an agreement will be high.



# Transaction cost under PA

- Under the PA, any modification to the catch rule equitably affects all of the fishermen.
  - The allocation of costs and benefits is identical among vessels.
  - No advantage and disadvantage in any modification
- Transaction cost is low enough to modify the rule in a smooth and prompt way.

# Solidarity

- PA enhanced the solidarity among fishermen.
- Each fisherman naturally considers more the interest of the community under PA.
- Before PA, there were many disputes among fishermen.
  - Witnessed by a medical doctor in Yui
- Solidarity in turn contributes to lowering transaction cost.

# 5. FAQs

# 1. Is there any moral hazard for fishermen?

- Not occurred in Suruga Bay, where strong relationships among fishermen are maintained.
- Under such circumstances, a fisherman who caught less shrimp would feel great shame in being supported under the PA by the other fishermen who caught more shrimp.

## 2. How were all of the fishing vessel owners able to agree to the PA?

- The strong leadership of one particular vessel owner, Kozo Hara, was very significant. He gained a strong reputation in the community and was always able to catch the largest volume of shrimp.
- Such a trusted person advocated the necessity of the reform, despite himself suffering a loss caused by the reform.
- It could convince all of the fishermen to agree to the PA.

### 3. Can the PA be applied to other species?

- Even before PA, the fishermen empirically knew the price of sakura-ebi was negatively related to catch volume, because they had a monopoly of the market.
- If the market of a fish species is competitive, a reduction in the catch volume will lead to a decline in total revenues.
- Not so easy for fishermen to commit to.



# 6. Discussion

# Sakura-ebi resource seems to be decreasing again today.

- No one knows the exact reason.
  - climate change, deforestation in the upstream of the rivers flowing into the bay.
- The catch size is still too large and the number of vessels is too many in comparison with the fishery area.
- The need for reform is already recognized by the fishermen, but deciding to reduce the scale of the fishing industry is not easy for them.

Thank you!