

博士論文

# Decentralization and Participatory Approach in Fisheries Management: Case Studies in Chile and Japan

(資源管理における地方分権と参加型アプローチ:チリと日本の事例)

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# Outline of the presentation

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- Introduction
- Theoretical Framework
- Methodology
- Case study: Japan a CBFM Approach
- Case study Chile: Private rights based management an a tool based on participatory approach
- Co-Management for High Mobile Species in Coastal Fisheries: Cases in Seto Inland Sea, Japan
- Conclusions

# Introduction

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# Introduction

- Since 1997 a massive promotion for implementing a new fishery management tool based on participatory approach was introduced in Chile.
- Participation and decentralization have been accepted as successful approaches in fisheries management. Example: Japan
- Benefits seem clear, not only in a betterment resources' management also: reduction transaction costs, empowering communities, multifunctionality, avoiding conflicts, etc
- The concept of participation and decentralization is often applied without rigor and without consider the complexities of the components related to the concepts
- By overemphasizing formal arrangements of decentralization and participation between State and resource' users is possible to ignore the aims of the concepts



# Objectives

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To review the concept of decentralization and participatory approach and implications for fishery policy in different management models

- To compare three participatory models for fisheries management in two countries: Chile and Japan
- To evaluate a CBFM in Japan, through main conditions considered as ideals for a sustainable management of common pool resources
- To analyze a Chilean participatory model and identify main elements for its implementation
- To analyze a participatory approach that focus in input-control measures for migratory target species in coastal fisheries in Japan.



# Decentralization

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- “devolution of central state assets and powers to local decision-making bodies: Local governments, local administrative branches of central government, etc” (Ribot, 1998)

# Types of decentralization



## ○ Deconcentration

- redistribution of authority from the central government to its own field branches (Ribot, 1998)

## ○ Delegation

- transfer of specific decision-making and management authority to semi-independent units (McCarthy, J. 2004)

## ○ Devolution

- strengthening and transfer of governing authority to independent, autonomous local government units (Ribot, 1998)

## ○ De-officialization

- change from State-control cooperatives to self-organized and autonomous cooperatives (Von Muralt, 1990)



## Participatory approach

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- “to increase the involvement of socially and economically marginalized people in decision-making over their own lives” (Guijt and Braden, 1999)
- “Direct and active involvement of stakeholders in the planning, decision-making, and actual management of the resources” (Mendoza, 2005).





# Types of participatory approach and definitions for this study

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- Co-management:
  - “the sharing of responsibilities, rights and duties between the primary stakeholders, in particular, local communities and the nation state” (WorldBank, 1999)
- Community-based fishery management:
  - “It is co-management arrangement whereby villages or other communal groupings are the primary partners and principal initiators of management action for the inshore fisheries in a specified locality” (FAO, 2004)

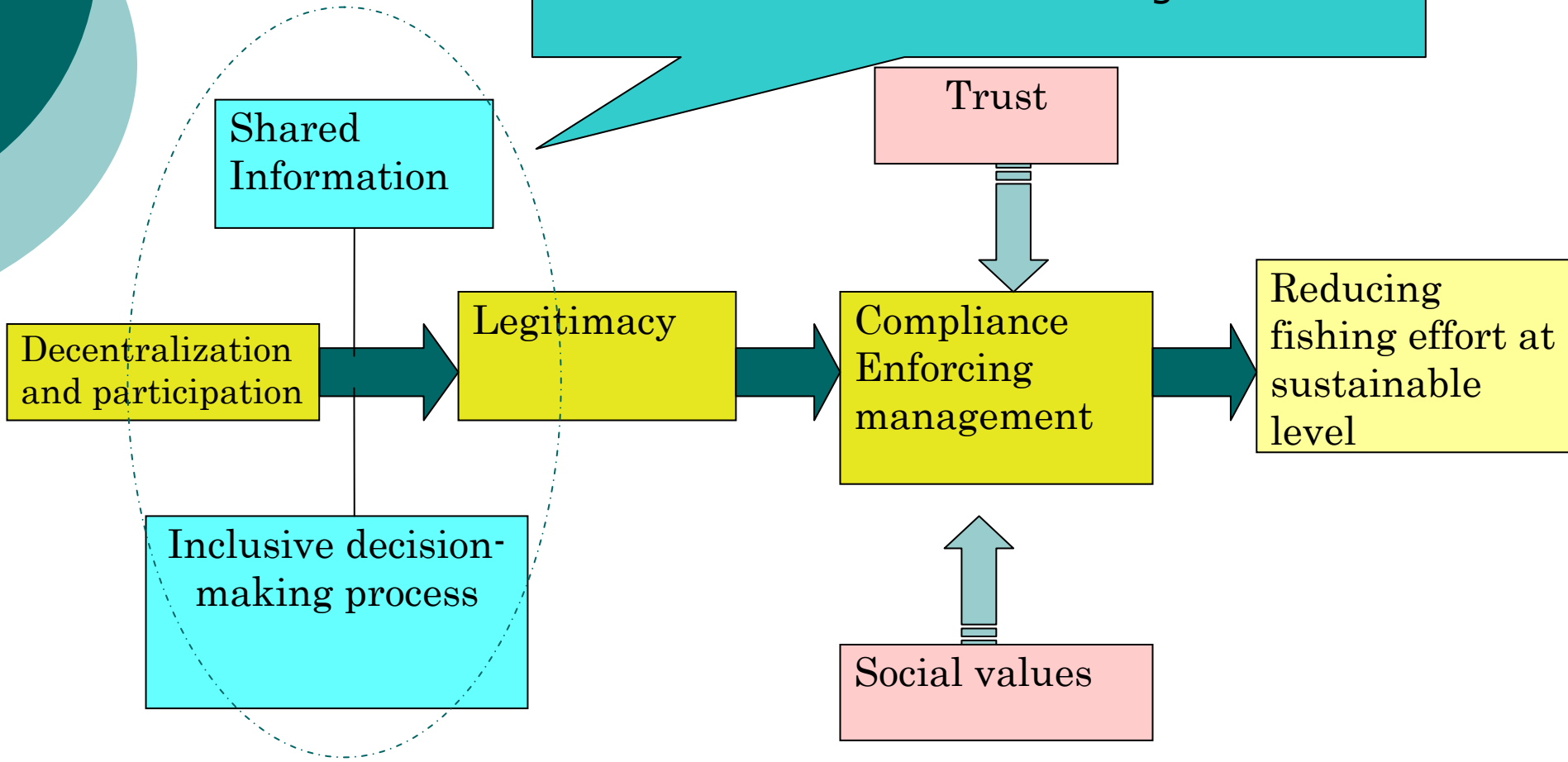


# Theoretical Framework

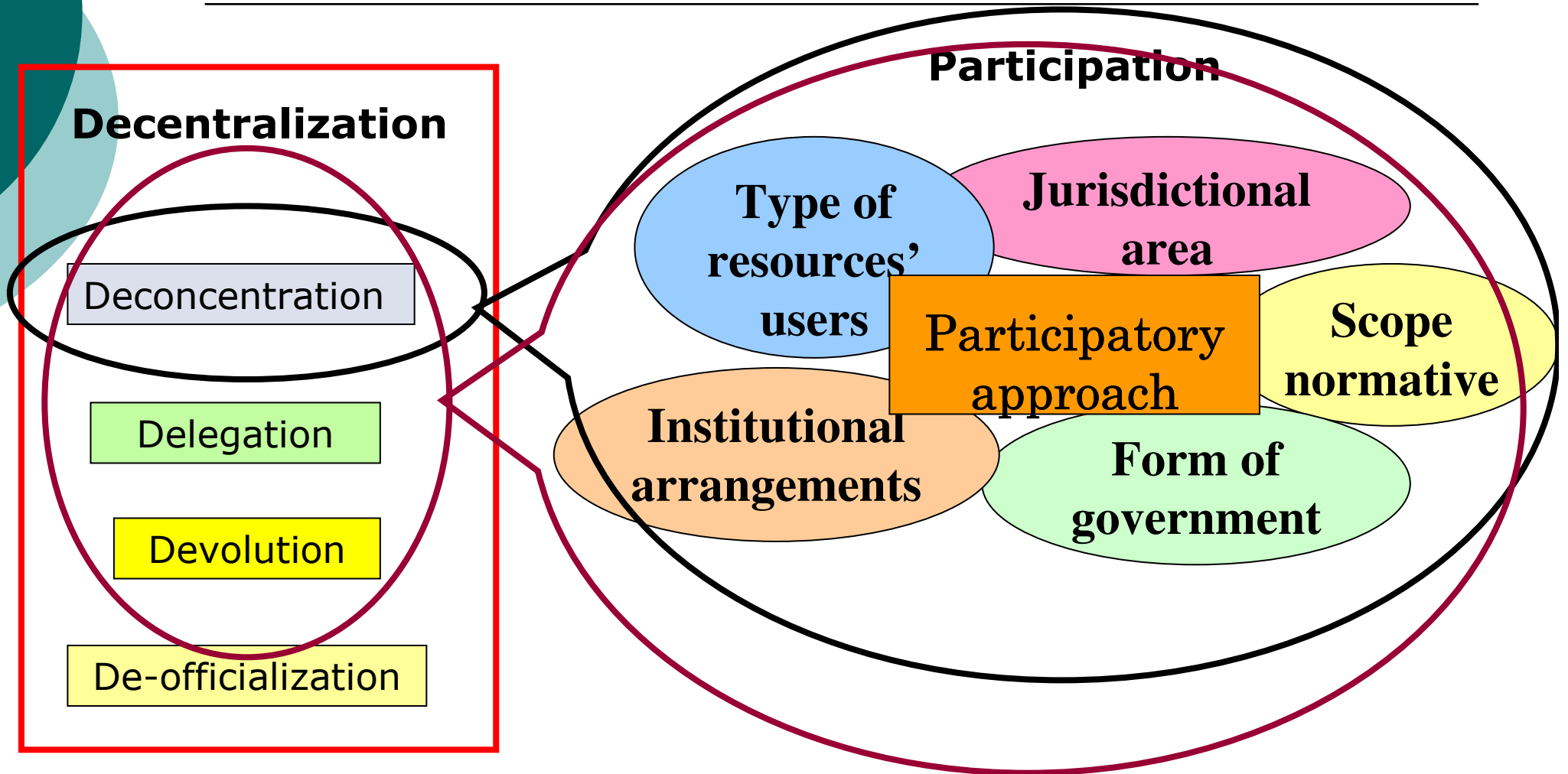
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# Contribution of participation to successful coastal resource management

Elements:  
Common property rights  
Low mobility of resources  
Existence fishers' organizations  
Sustainable institutional arrangements



# Different management models





# Methodology

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# Methodology

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- By comparison of three different participatory models:
  - A CBFM model in Nomaike FCA, Kagoshima Prefecture, Japan (common property rights)
  - A right-based management model and a tool based on participatory approach in Region 10<sup>th</sup>, Chile (common property rights)
  - A co-management model focused on high mobile species in Toyohama FCA, Hiroshima Prefecture, and Hinase FCA, Okayama Prefecture, Japan (open access resources)
- By comparison of ideal conditions for sustainable CPR management with a considered successful participatory model
- By making a general appraisal of sustainability of fisheries in the study area



## Methodology (ctd.,)

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- Qualitative model based on case study approach
- Collection data:
  - Semi-structured interview
  - Key informant interview
- Method and management data
  - Notes and recording
- Analysis
  - Critical Enabling Conditions (CECs) for sustainable management of common pool resources (CPRs)
  - SWOT analysis
  - Multicriteria analysis based on RAPFISH

# Case study: Japan a CBFM approach





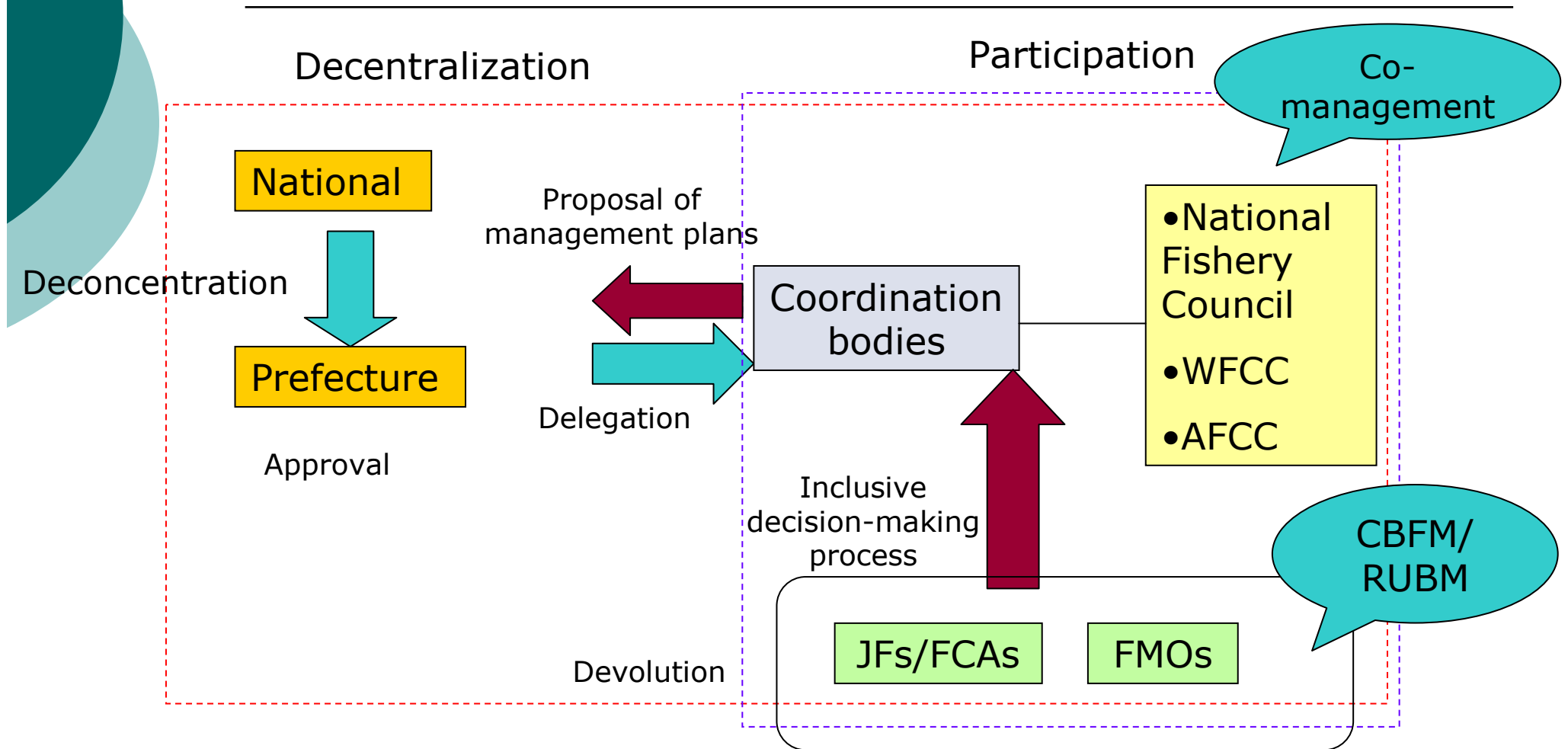


# Institutional Arrangements

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- Basic Fishery Law
- Coordination bodies: National council, Sea-Area Fishery Coordination Committee (AFCC), Wide-Area Fishery Coordination Committee (WFCC)
- Japanese Fisheries Cooperatives (JFs or FCAs)
- Fishery rights: Set-net fishery rights, demarcated fishery rights and Common Fishery Rights (CFRs)
- Customary laws
- Fisheries Management Organizations

# Characteristic of the Japanese model

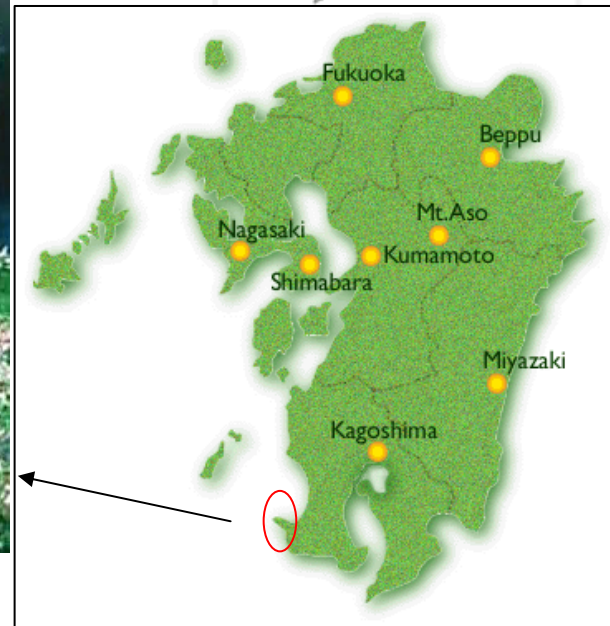


# Study area: Nomaike FCA, Kyushu; Japan.

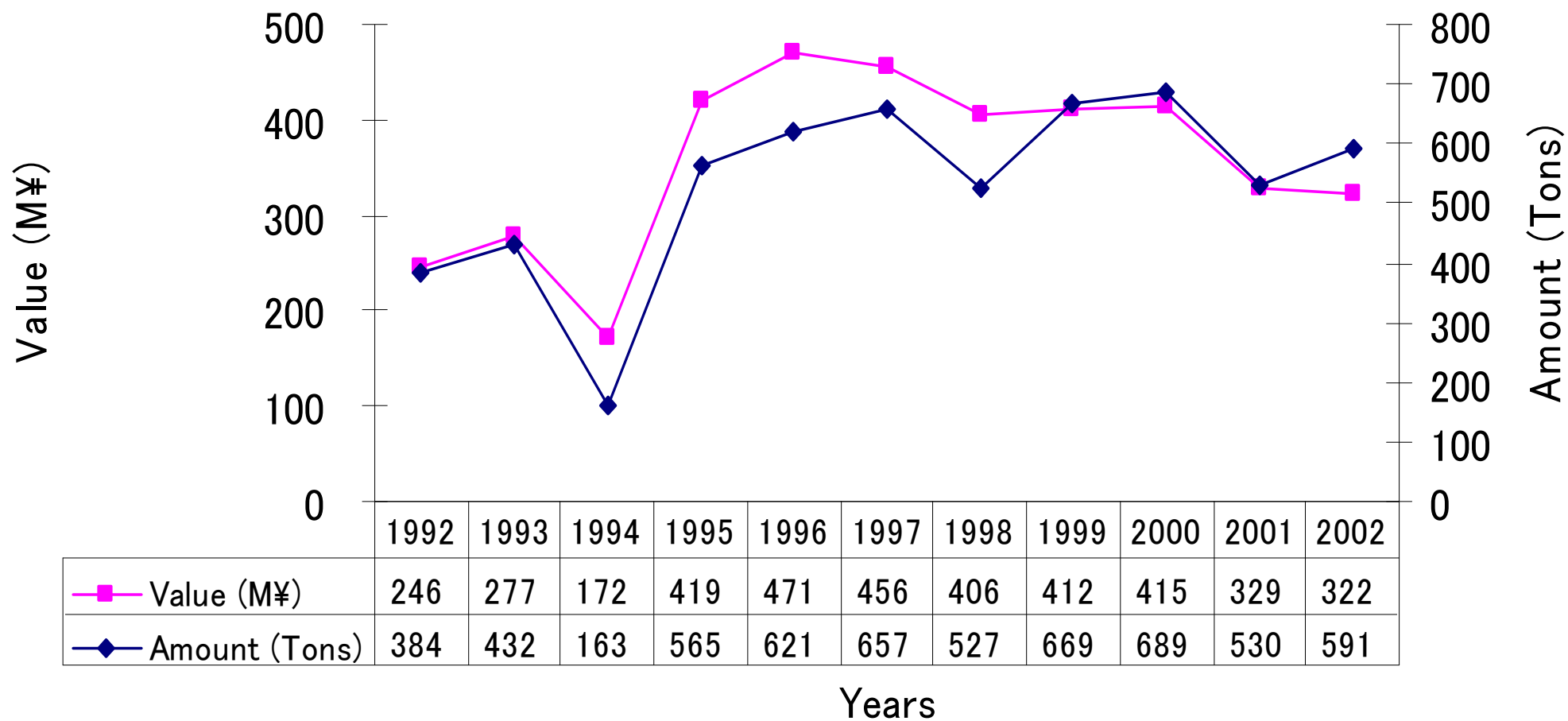
Nomaike



## Kyushu

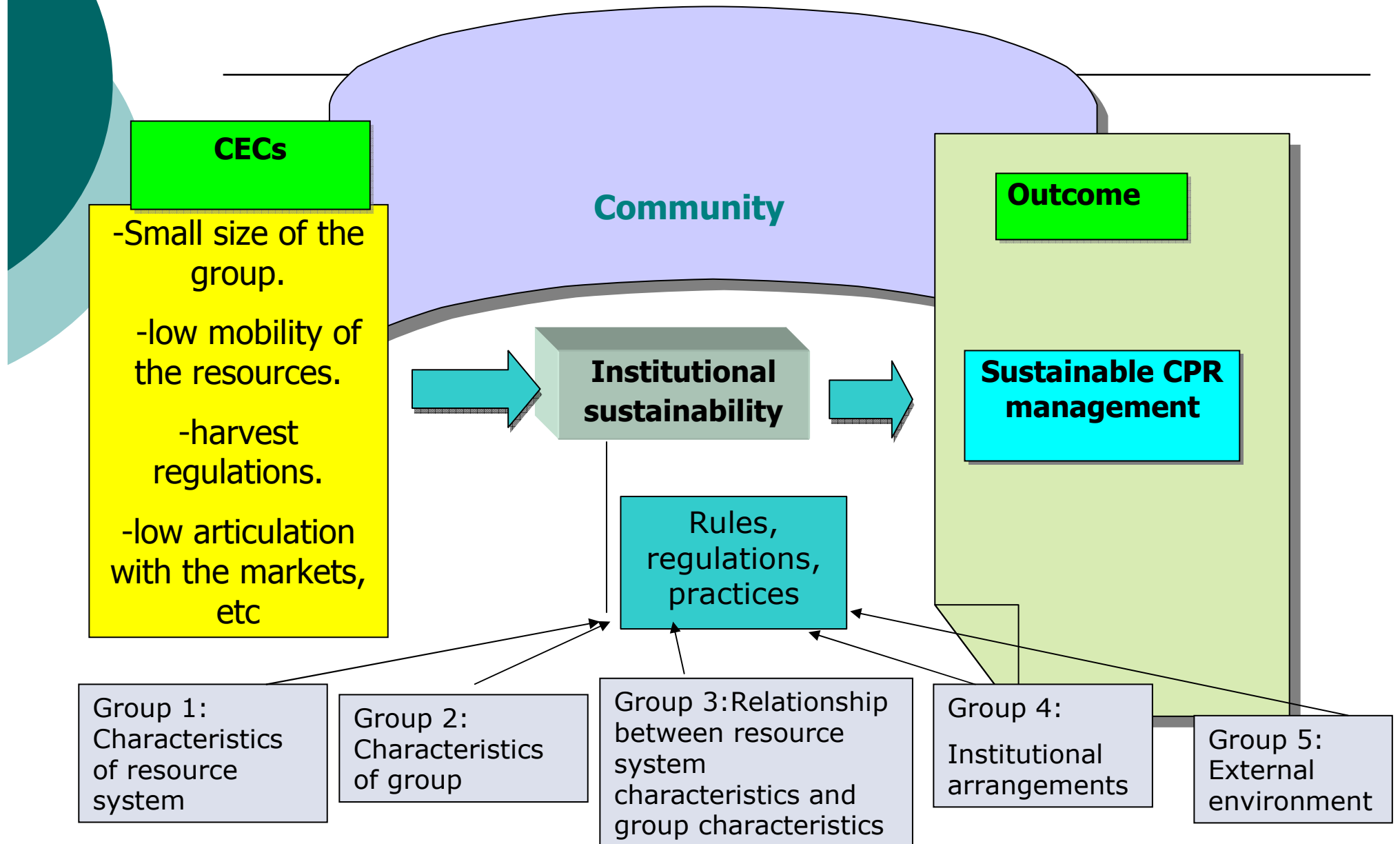


## Fishery production in Nomaike FCA



Source: Nomaike FCA, 1992 – 2002

# Critical Enabling Conditions (CECs) for Sustainability of Commons (Agrawal, 2001)



## Species considered in fishing ground management

### CECs Group 1:

Resource system characteristics

- Low mobile resources contribute to reduce subtractability and enforce excludability

- In Nomaie FCA the criteria of fishing grounds granted is to develop fisheries with sessile, benthic and local target species.

CFR No.	Fishing right type	Species allowed to fish
21	1	Seaweeds ("iwanori")
		Seaweeds ("Tengusa")
		Abalone
		Abalone "Tokobushi"
		Black snails ("kubogai")
		Japanese ivory-shell
		Rock lobster
		sea urchins
	2	Anchovy
		Grunts
		Barracuda
		Mullet
541	3	fishery by fish shelters
1,020	3	Yellowtail feeding fishery

Source: Nomaie FCA, 1992 – 2002

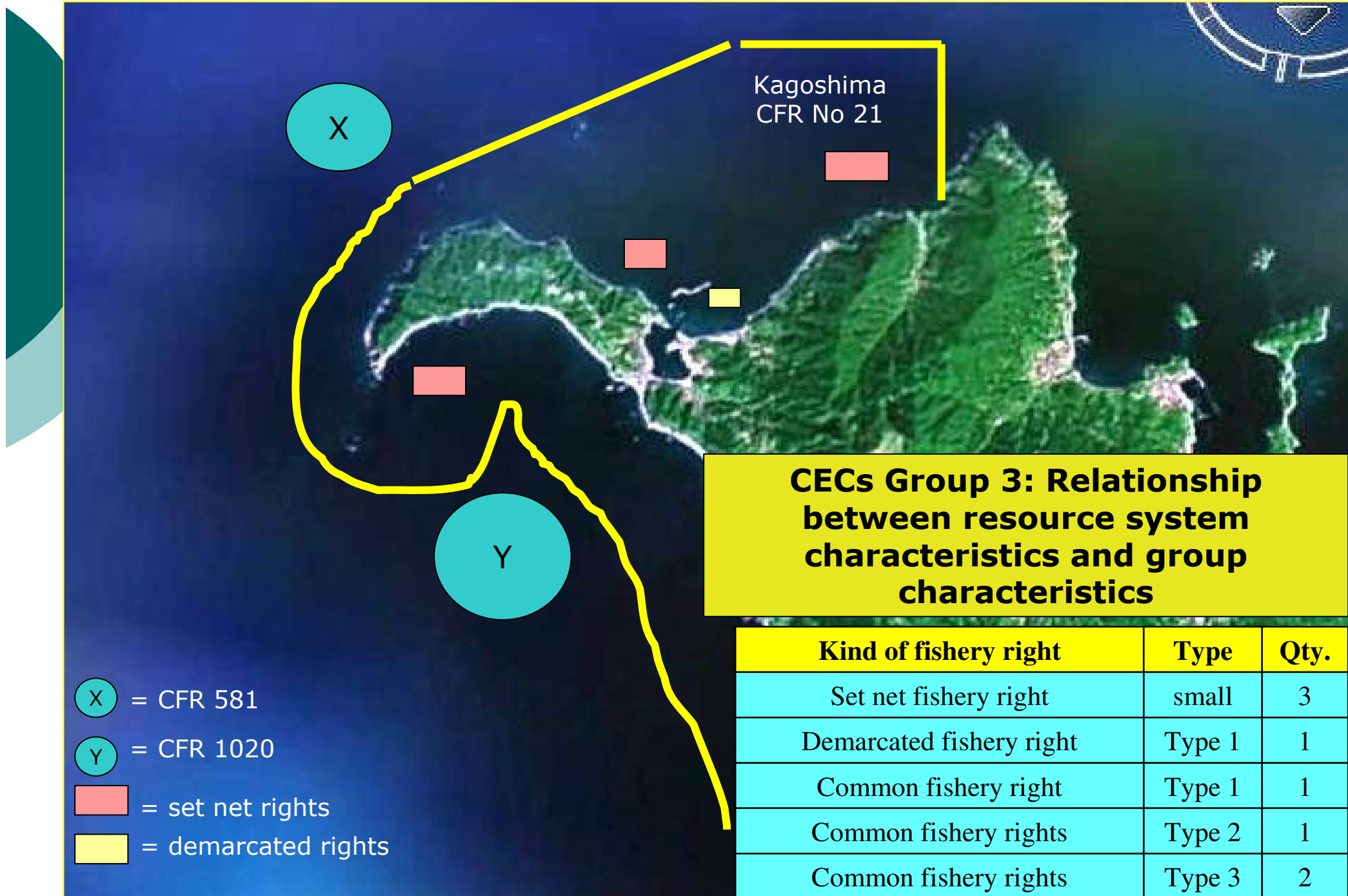


## CECs Group 2: Group characteristics

The characteristics of the resource' users are important factors to keep sustainable practices and regulations for a good management in CPRs.

The factors focus that the group should facilitate internal communication, keep and strength social capital and independent of economical pressure.

- Nomaika FCA was created before the enactment of current legislation
- Self-management institutions has root in long traditions
- Small community, most of them over 65 years old with strong ties between each other
- Low level of poverty in the community



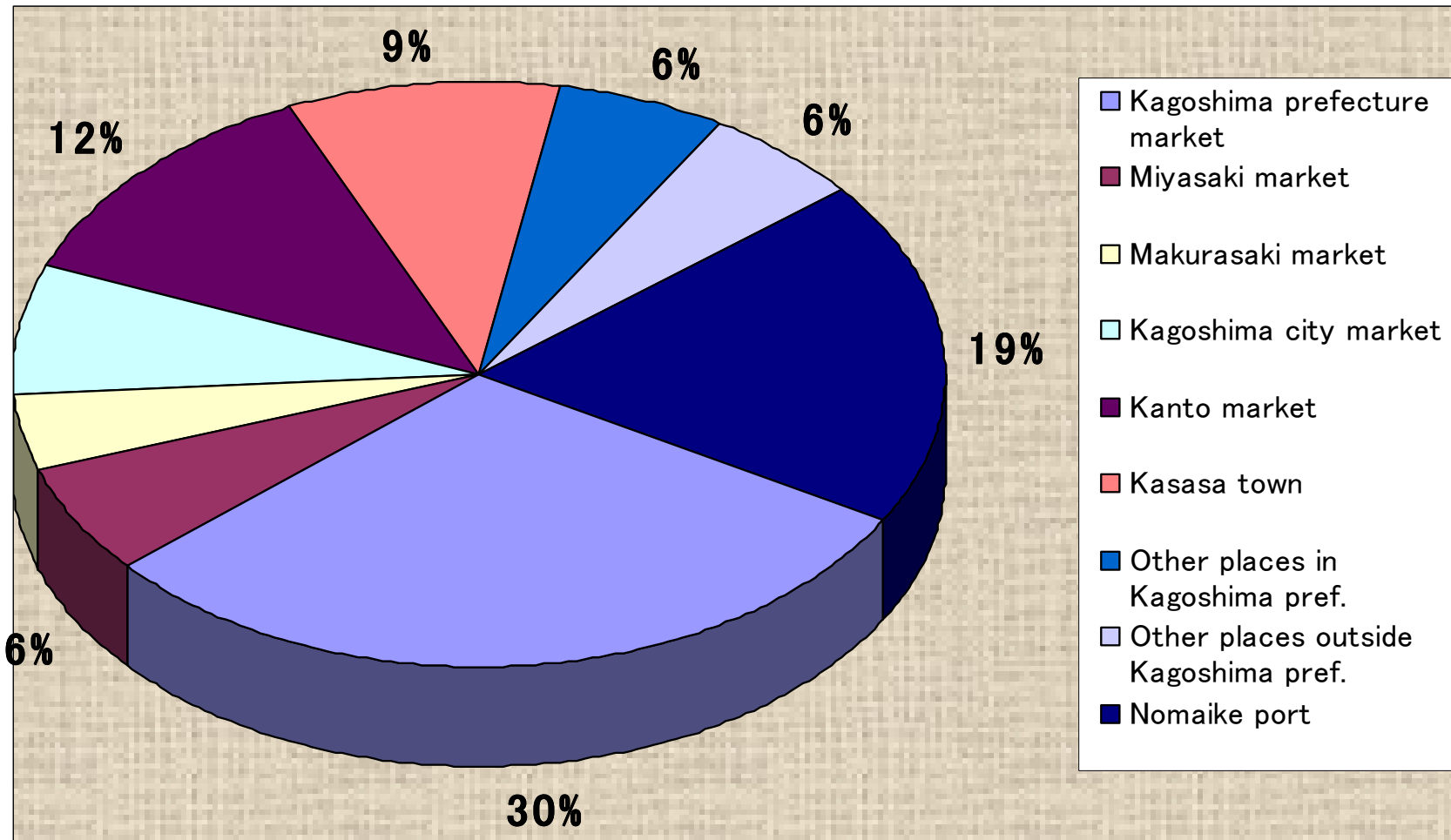


## CECs group 4: Institutional Arrangements

Name of fishery	Period of use, fixed by Prefecture	Period of use according Internal regulations
“Tokobushi” (abalone)	All year round	5/1 – 9/30
“Uni” (sea urchin)	“	9/1-2003/4/30
“kibinago” seine net	“	11/1-2003/3/31
grunts and barracuda net	“	3/1-12/31
Red frog crab net	“	8/1-2003/5/31

*Source: Nomaiké FCA, 1992 – 2002*

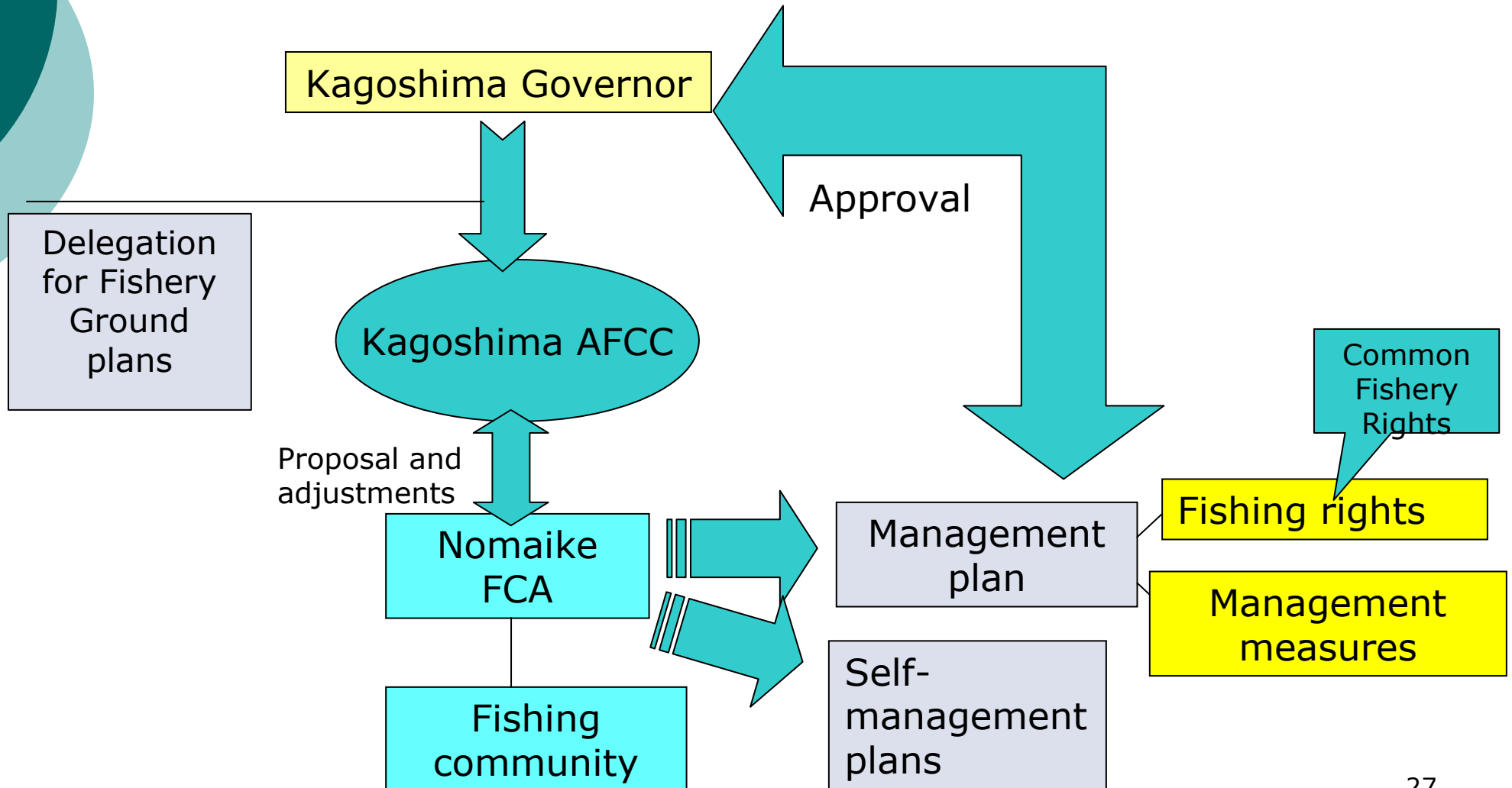
# CECs Group 5: External environments



Source: Nomaike FCA, 1992 - 2002

Despite of relative isolation Nomaike FCA has acceptable articulation with markets

# Nomaike FCA: A CBFM model





## Findings

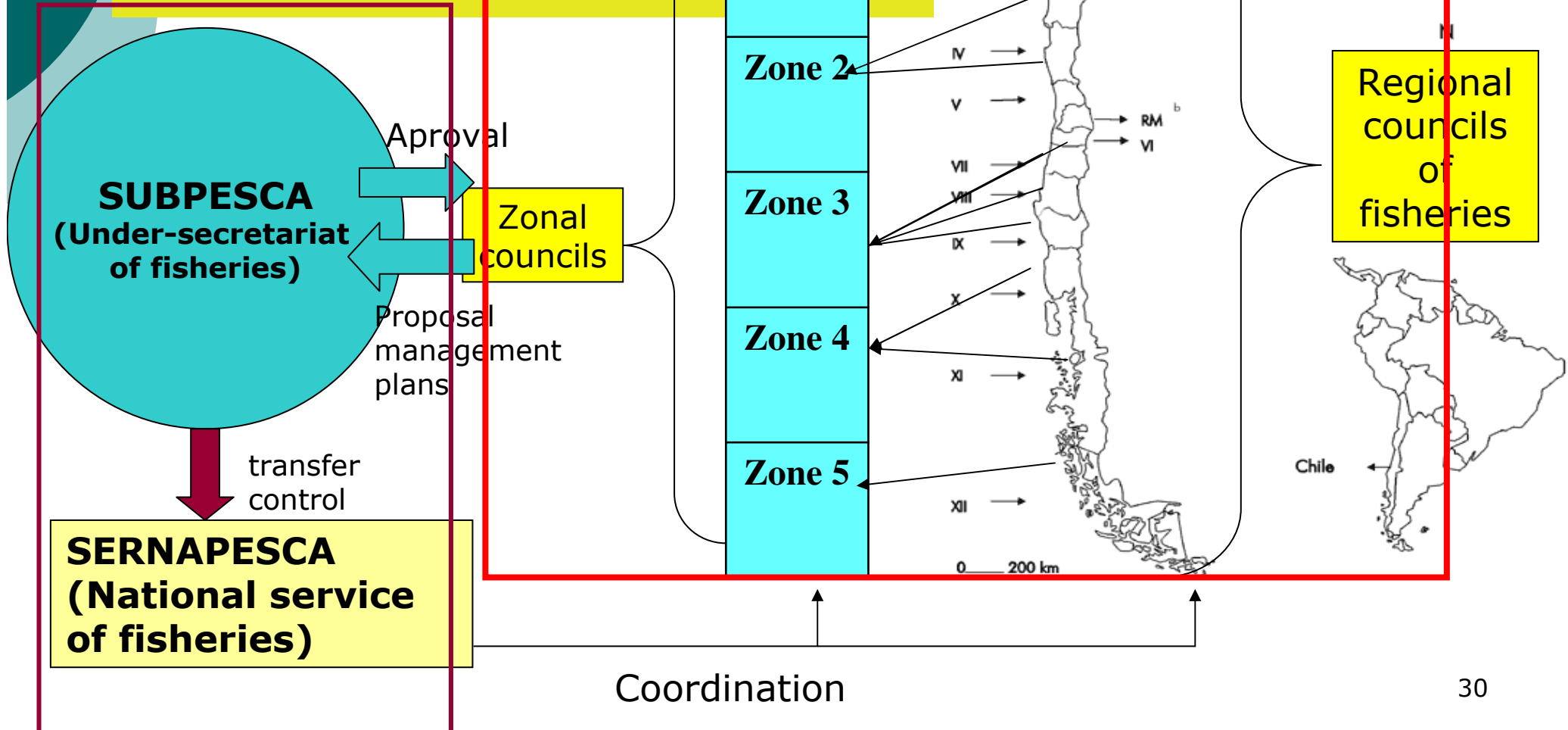
- Most of CECs in Nomaike FCA were concordant with the observations
- Group CECS 1 resource's characteristics: species granted for exploitation in fishing ground are according to the low mobility criteria.
- Group CECs 2 group characteristics: As a typical organization in Japan, Nomaike FCA, have long tradition in self governance of resources.
- Group CECs 3 institutional arrangements: Rules are locally devised, generated by the members from subgroups in the base level of the FCA. Management measures are more strict than the propose by the Prefectural Government.
- Group CECs 4 external environment: Nomaike FCA seems has high articulation with markets different from that is stipulated by CECs

# Case Study Chile: Private rights based management an a tool based on participatory approach

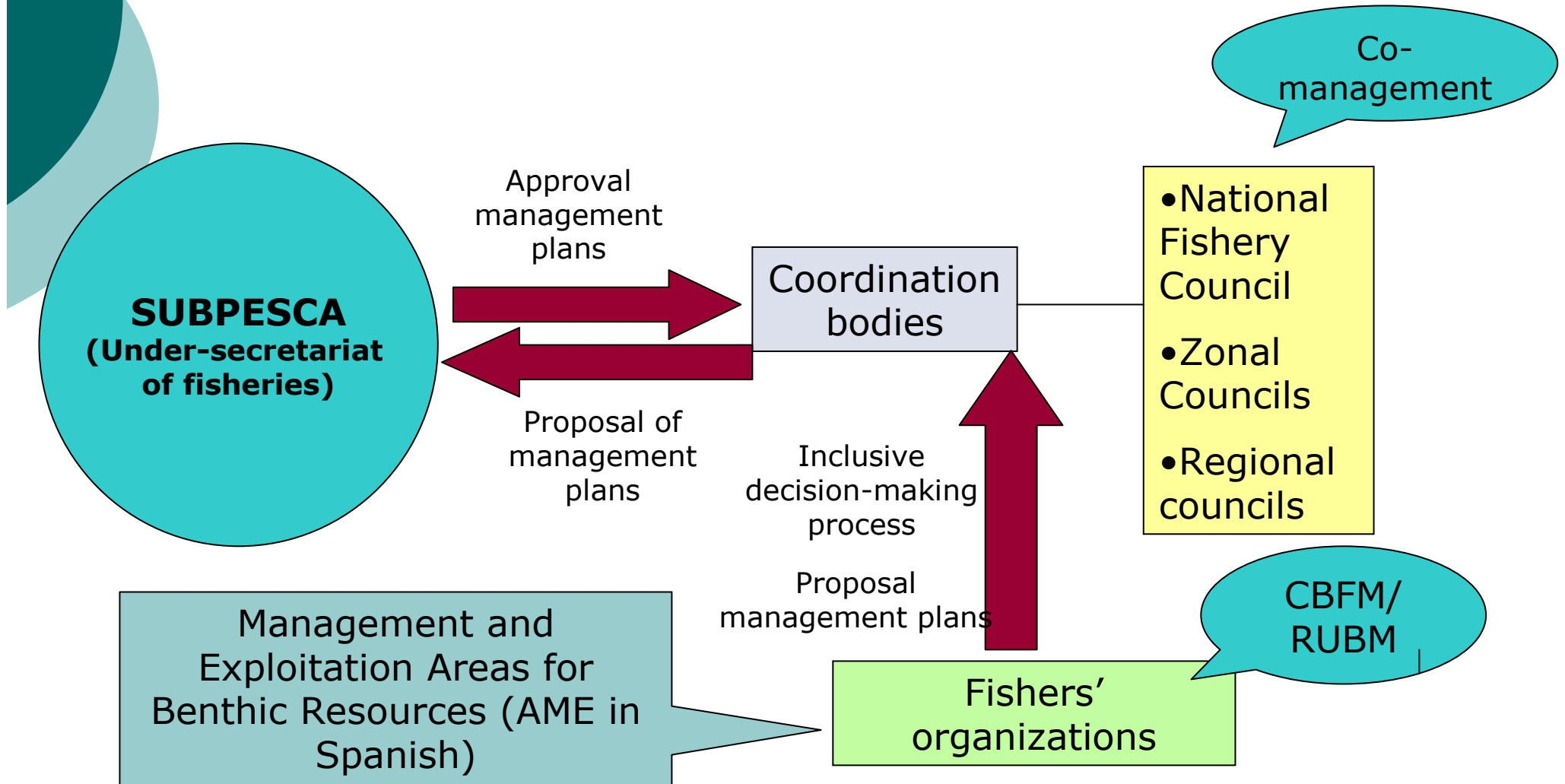


# Characteristic of the Chilean Model: Decentralization

Deconcentration



# Characteristic of the Chilean Model: Participation





# Areas for Management and Exploitation (AME): common property rights



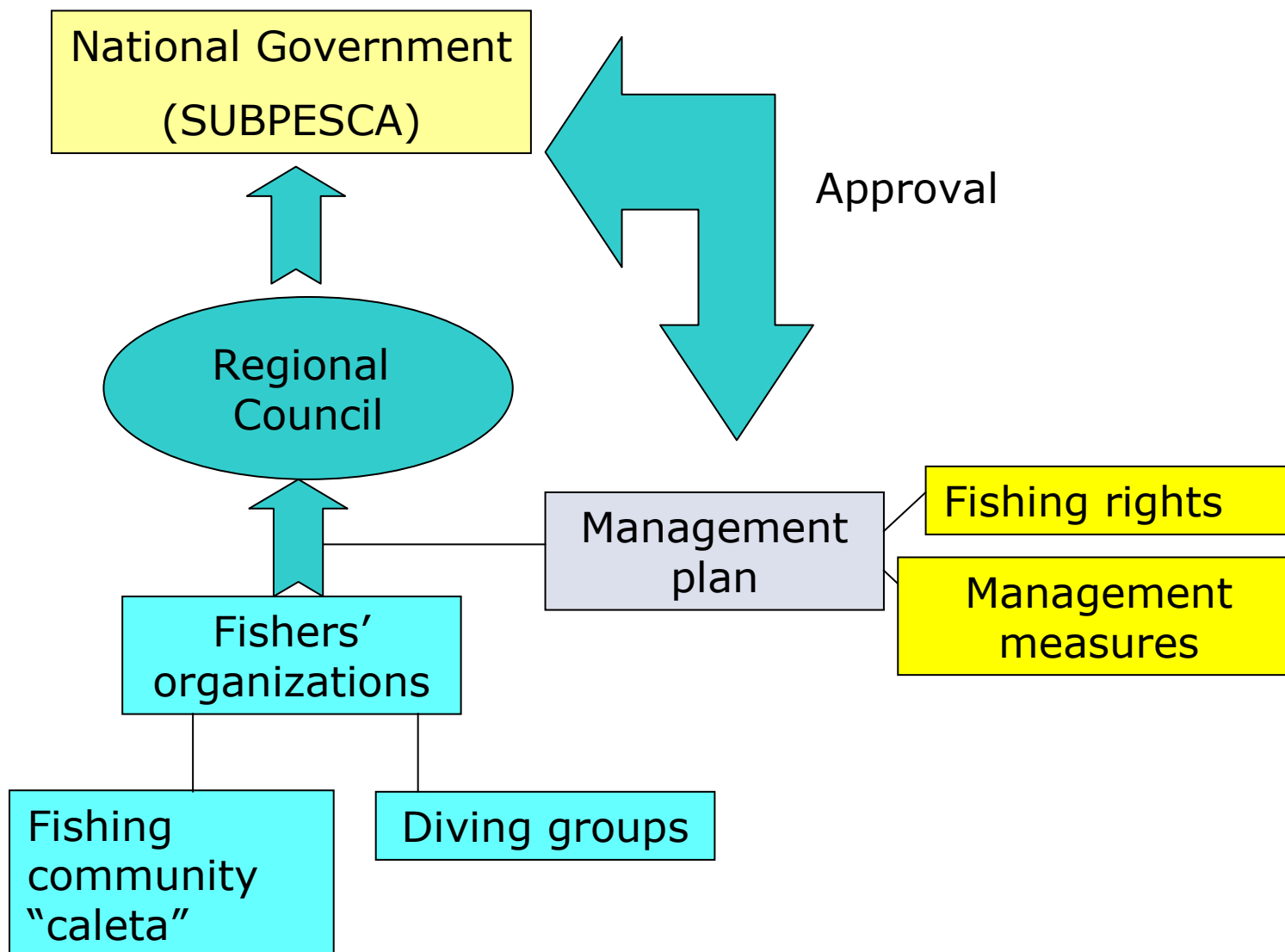
Areas for Management and  
Exploitation (AME)for  
Benthic Resources

- Resources:
- Chilean abalone ("Loco")
  - Sea urchin "Erizo"

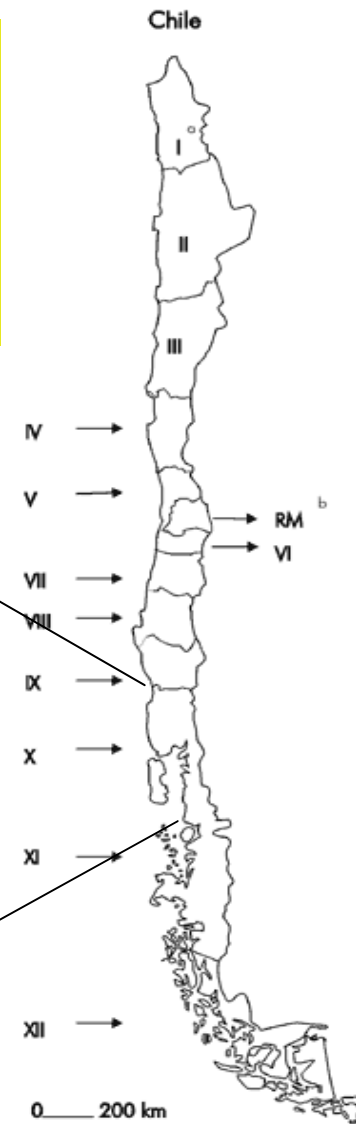
■ AME gives an exclusive access to benthonic resources in a portion of the coast, to a local organization of artisanal fishers



# AME: a CBFM/RUBM model



# Case study in Region 10<sup>th</sup>





# SWOT analysis

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- In order to better understand the present situation of AMEs, a SWOT analysis was applied
- A SWOT Analysis is a strategic planning tool used to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a project
- The SWOT analysis provides an overview of the potential and problems to implement AME in the Region 10th.
- It also reveals insights for developing possible policies.

## SWOT of Region 10th for implementation of AME

<p><b>Strengths</b></p> <ul style="list-style-type: none"><li>● Region 10<sup>th</sup> is major contributor to benthic resources in the country</li><li>● Important benthic industry established.</li><li>● Impact to small-scale fishery sector is high</li><li>● Number of benthic resource's users is high</li></ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"><li>● Fishers' organizations concentrated in same locations of the coast.</li><li>● In mostly fishing villages transportation and condition of port facilities are in low level</li><li>● Products illegally captured.</li></ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"><li>● Stabilization of marketing system with new relationship between buyers and users</li><li>● Favorable trading conditions for benthic fishery under FTA's</li><li>● AMEs in other regions of the country with longer experience may trespass important lessons.</li></ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"><li>● Legislation not provides a support for exclusivity of fisher user's rights.</li><li>● Lack of support from the government at the beginning of operations</li><li>● Lack of appropriate training and knowledge in marketing matters</li></ul>



# Main Concerns and Factors that Influence Implementation of AME

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- Data was collected from 115 coastal villages in this region during 2003
- Data correspond to 96% of the total coastal villages in Region 10<sup>th</sup>.
- Semi-structured interview and key informant interview
- Observations of some aspects of the communities were correlated with the level of implementation of AME using an Spearman correlation method to find factors that may influence implementation of AME

## Problems faced by AMEs ordered by order of importance

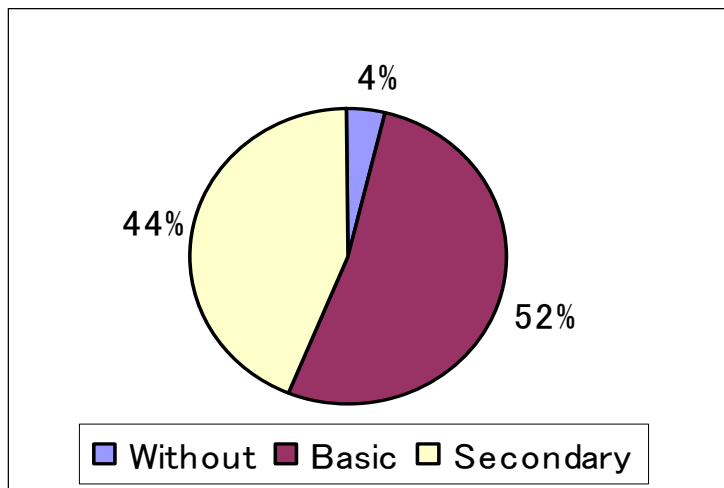
Problems	%	Rank
Cost of surveillance may be high	61	1
Need support to improve marketing	58	2
Illegal marketing	56	3
More training for improve management of areas	51	4
Delay in legal authorization for landings	45	5
Lack of appropriate landings infrastructure	40	6
Need support for evaluating stocks	36	7
Prices still are low	20	8
Need appropriate leadership	18	9
Organization need to be improved	18	10
There is not possibility for restocking	11	11

## Summary variables for Spearman bivariate correlation

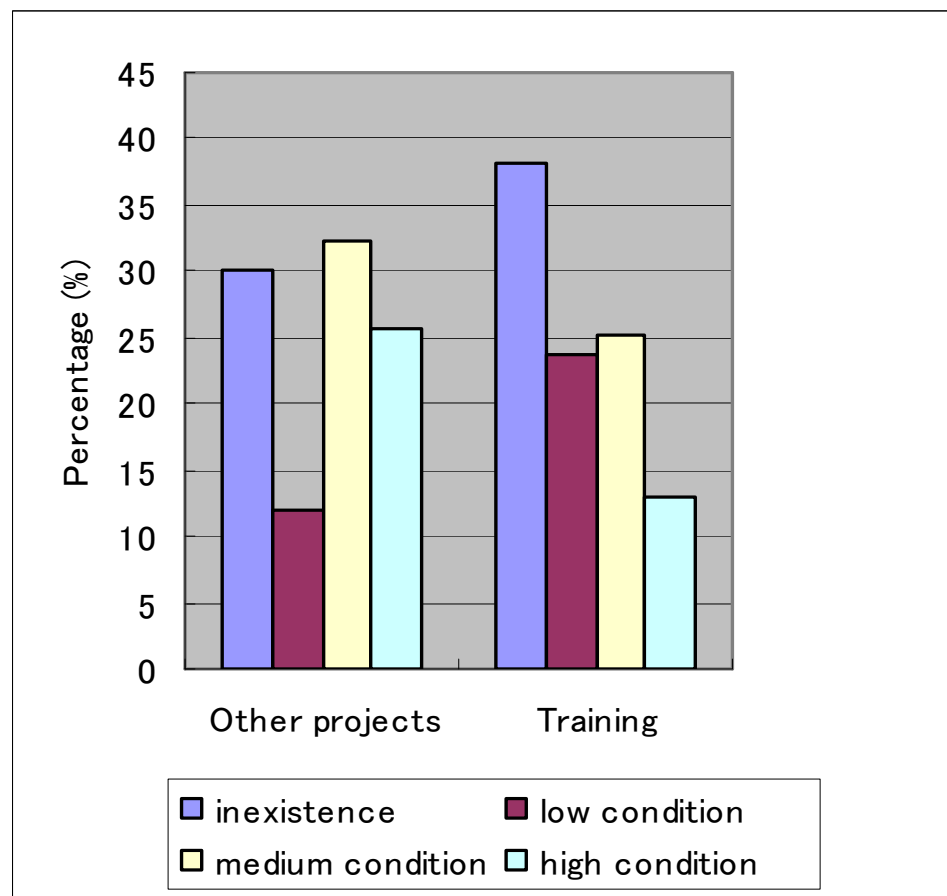
Particulars	Mode	Median	Mean	Std. Deviation
Years of existence	6	8	8.92	5.82
No. members	26	37	46.75	36.07
No. women members	0	4	8.25	11.96
Age	Min=17	Max=70	43.42	15.27

## Summary variables for Spearman bivariate correlation (ctd.,)

Educational level



Training level and level of implementation of other projects in the community.



Source: Own elaboration from primary data





## Results of Spearman Bivariate Correlation

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- Results shows a high correlation of 0.6 between development of complementary project and level implementation of AME.
- Fishers' organizations that have been developing alternative and complementary projects are interested to face new projects such as implementation of AME.
- The same situation is seen between level of training and implementation AME.
- Other aspects of the organizations did not have significant correlation with implementation of AME.



## Summary of Findings

- Characteristics of Region 10th favor the implementation of AME.
- AME is highly pertinent due to the factors such as the natural productions of benthic products, and the relevant impact on small-scale fishery, especially on the high concentration of benthic users.
- Nevertheless, it is possible to identify some important challenges to achieve a successful implementation of AME. One challenge is how to strengthen an effective exclusion in areas of AME.
- Main concerns among fishers is surveillance, support for marketing and illegal fishing.
- It was significant correlation between number of projects implemented, level of training of fisher's organizations and level of implementation of AME may indicate that empowering of communities is one of the main elements for CBFM.

# Co-Management for High Mobile Species in Coastal Fisheries: Cases in Seto Inland Sea, Japan





# Multicriteria Analysis

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- MCA is based on a technique developed in Rapfish (Pitcher and Preikshot, 2001)
- Simple and easy-scored attributes to provide a rapid and multidisciplinary appraisal of the sustainability of fishery
- Sustainability is described quantitatively by a set of defined criteria represented in a numerical analysis by a set of scored attributes
- It applies a statistical ordination technique called Multi-dimensional scaling (MDS) to reduce the analysis to 2 dimensional space
- The result of ordination is plotted in a very visible way that locates fisheries in an axis between “bad” and “good” sustainable fisheries.

# List of definitions of ecological attributes for MCA

Attribute	Scoring	Good	Bad	Description
Exploitation status	0,1,2,3,	0	3	Under (0); fully (1), heavily (2); over-exploited (3)
Recruitment	0,1,2	0	2	Recruitment stable (0); recruitment unstable (1); recruitment overfishing (2)
Level catch	0,1,2	2	0	Catch level were divided into 3 groups by the ratio between average period 1992-2004 and 1983-1992: low (<0.7)=0; medium (0.7-1.3) = 1; high (>1.3) = 2
Trend	0,1,2,3	3	0	Decreasing (0), unstable (1), stable (2) and increasing (3)
Migratory range	0,1,2	0	2	No. jurisdiction of mobility: 1-2 (0); 3-4 (1); >4 (2)



Scoring of attributes  
for Seto inland sea  
fisheries

<b>Attributes &gt;Seto Inland Sea</b>	exploitation status	recruitment	Level catch	Trend	migratory rang e
Japanese anchovy	1	2	1	3	2
Japanese Jack- Mackerel	1	0	2	2	2
Bastard halibut	1	1	0	1	0
Ridge-eye-flounder	1	1	2	2	0
Largehead hairtail	2	1	0	0	1
Red seabream	2	1	1	2	0
Black porgy	1	0	1	2	0
Spanish mackerel	3	2	0	1	2
Flathead mullet	1	0	0	1	0
Japanese seaperch	1	0	2	2	0
Ma-anago eel	1	1	1	2	0
Common Rockfish	1	0	0	0	0
Rockfish	0	0	1	1	0
JapaneseHalfbeak	1	0	2	2	1
Kyusen	1	0	0	1	0
Tiger Puffer	1	0	0	1	0
Ainame	0	0	0	1	0

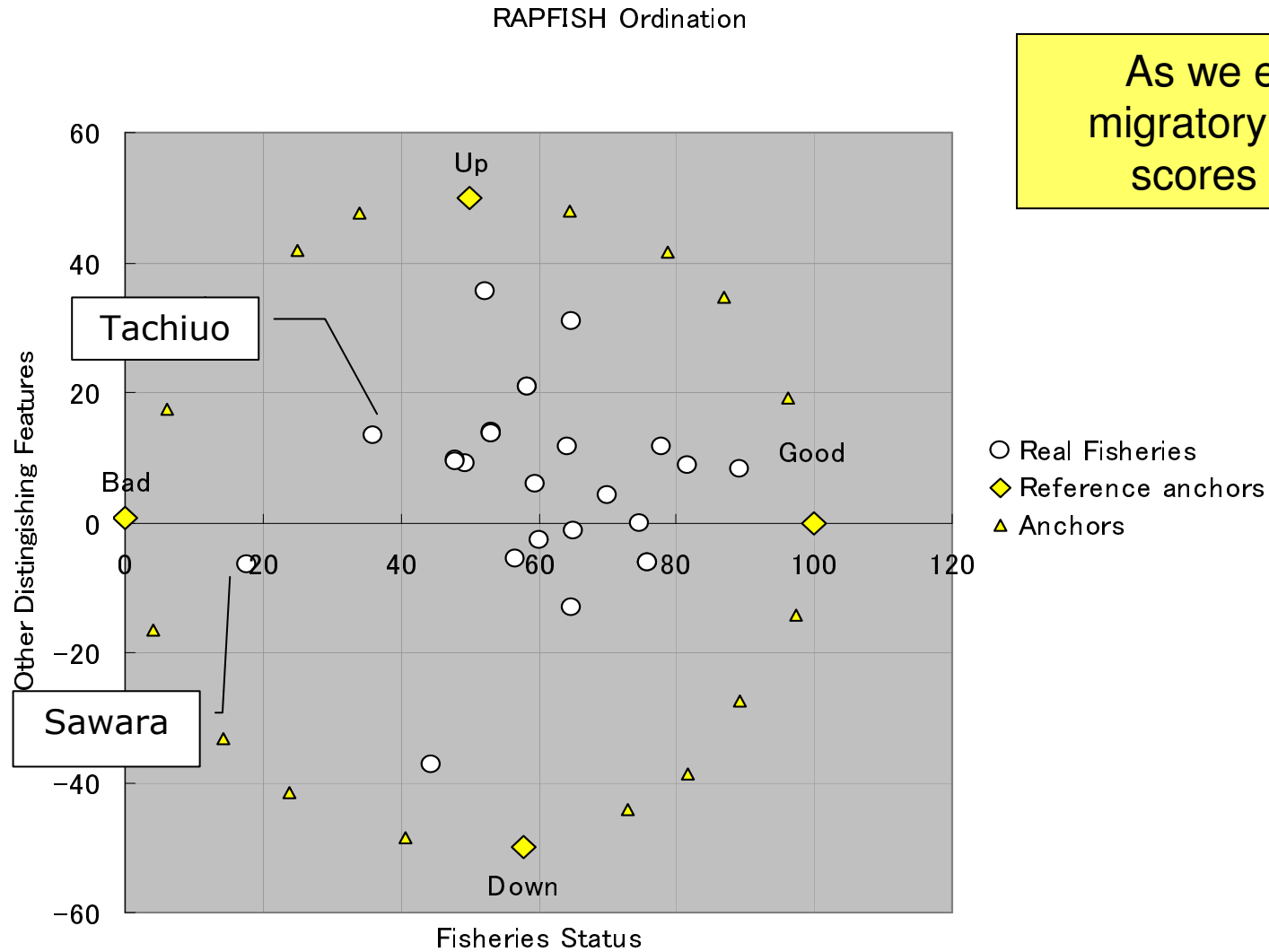


Scoring of attributes  
for Seto inland sea  
fisheries

Ctd

<b>Attributes &gt;Seto Inland Sea</b>	exploitation status	recruitment	Level catch	Trend	migratory rang e
Prawns	1	0	0	1	0
Blue crab	1	0	2	2	0
"Kou" squid	1	0	2	2	0
Octopus	1	0	1	2	0
Sea cucumber	1	0	1	2	0
Squilla (mantis)	1	0	0	1	0
Turban shells	1	0	1	1	0
Clams	1	0	0	1	0
"Wakame" (seaweed)	1	0	0	1	0

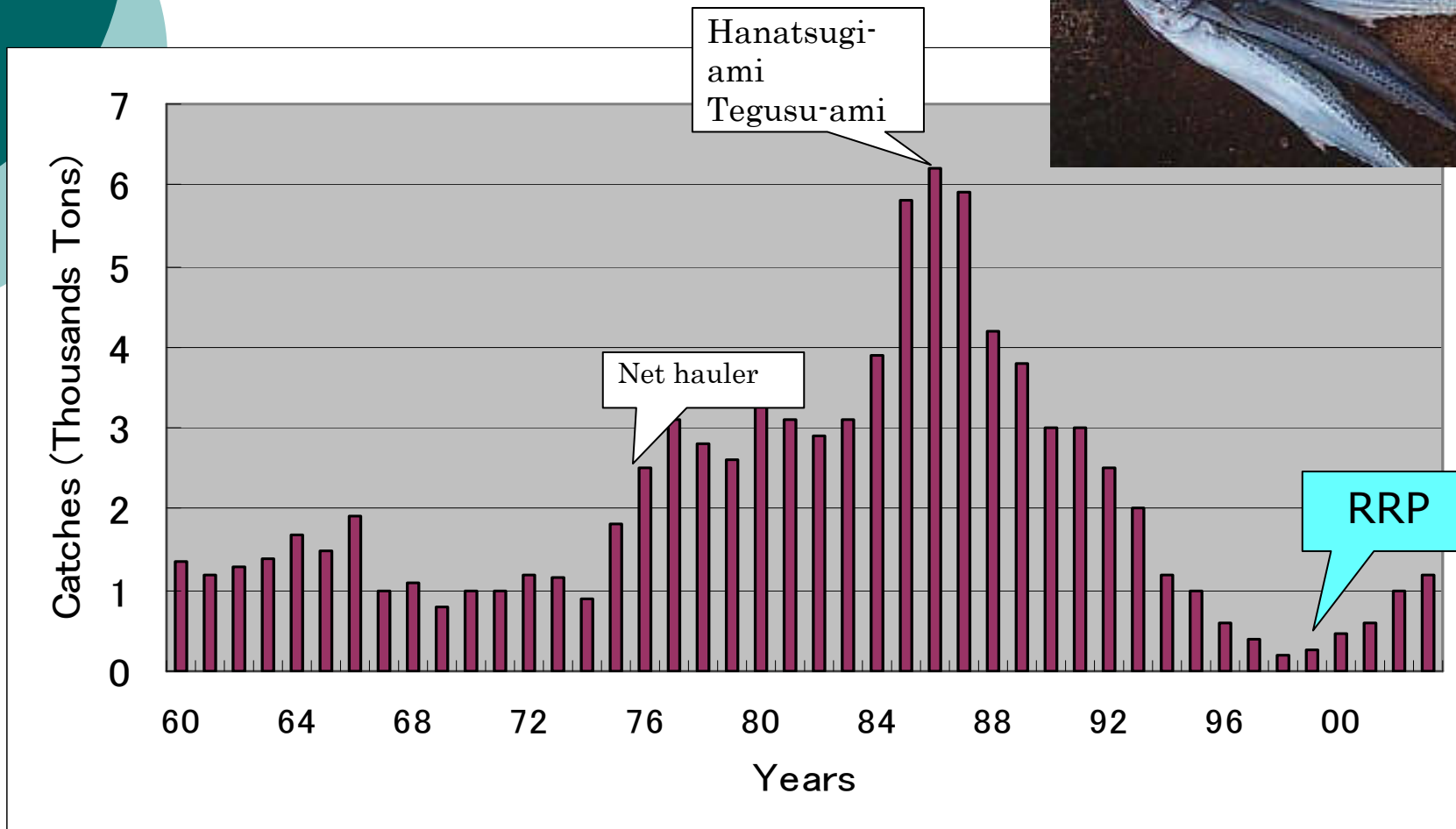
# Results of the RAPFISH ordination



As we expected certain migratory species have low scores of sustainability



# Catch (t) variation of Sawara



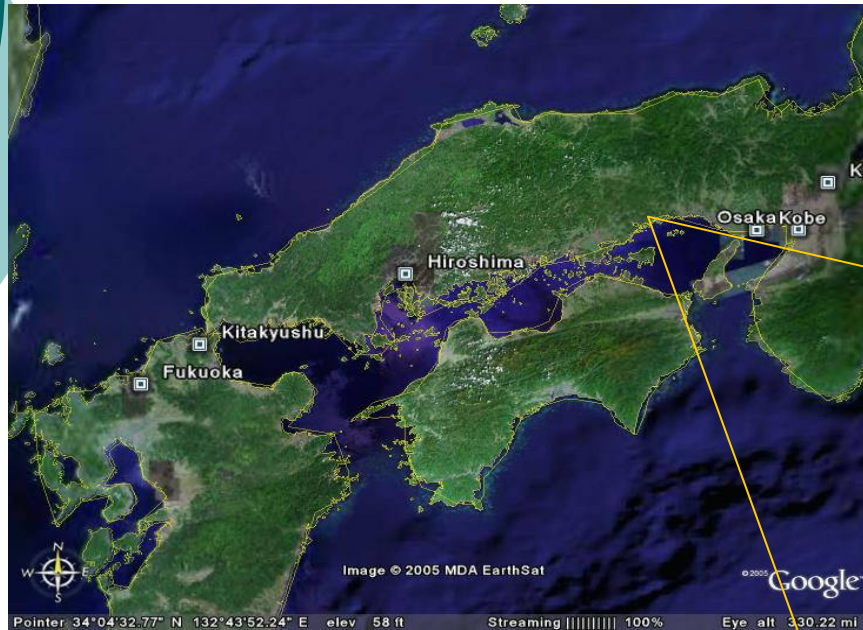


# Resource Restoration Plan (RRP)

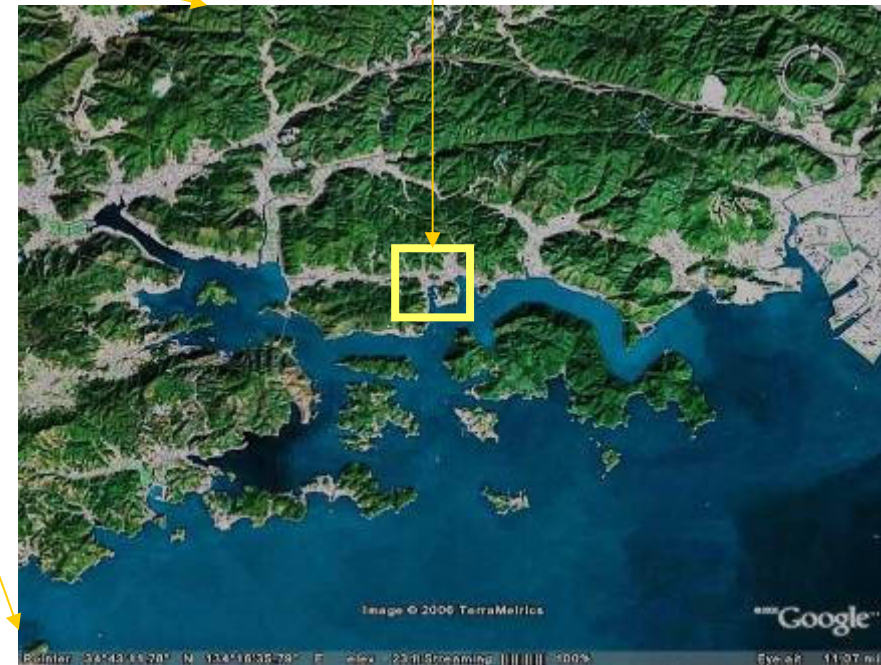
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- “Sawara” RRP(shigen-kaifuku-keikaku) is part of the Japanese policy to recover collapsed fisheries
- RRP consists in 4 important line of action:
  - reducing fishing effort through establishment of total allowable effort (TAE)
  - setting strict and input-control measures such as increasing mesh size, closed seasons, and limit of total catch
  - stock enhancement through re-stocking plans
  - restoration of habitats.

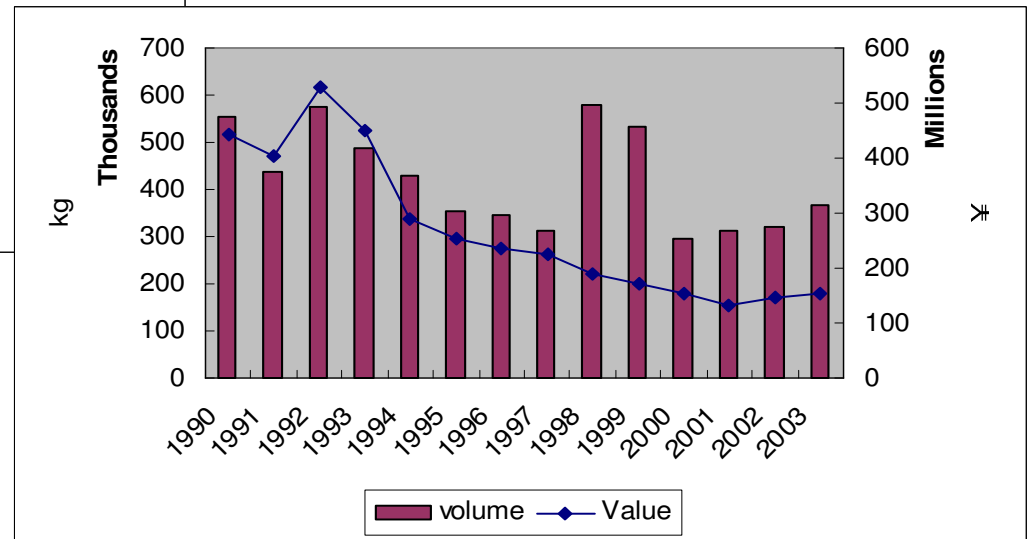
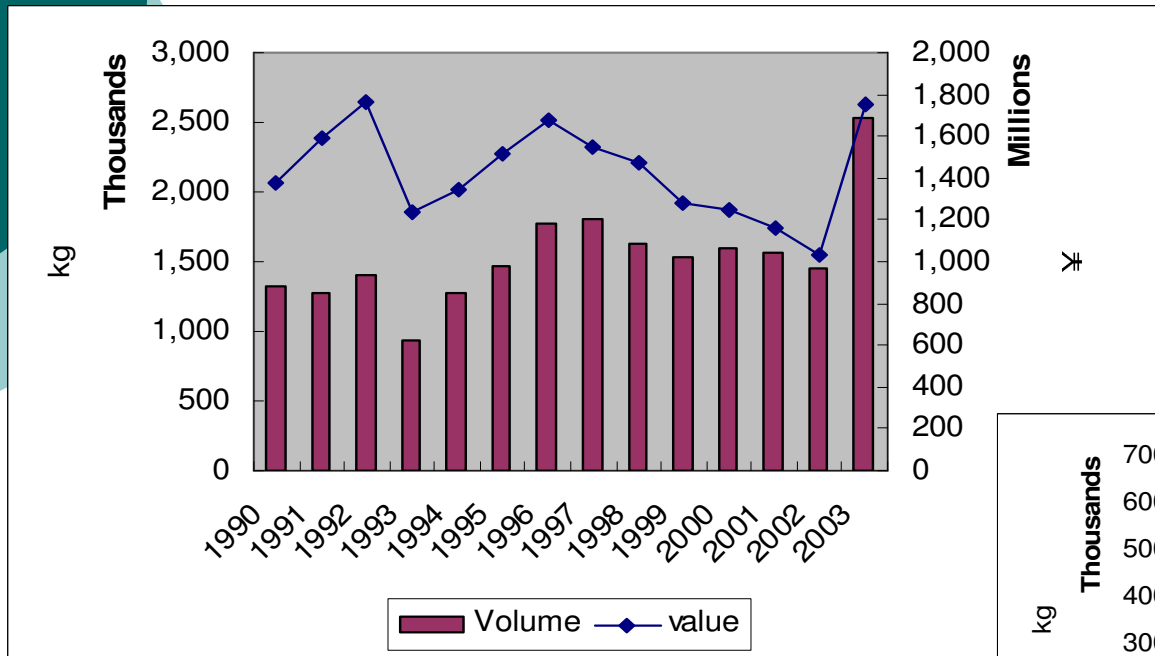
# Hinase FCA, Okayama prefecture



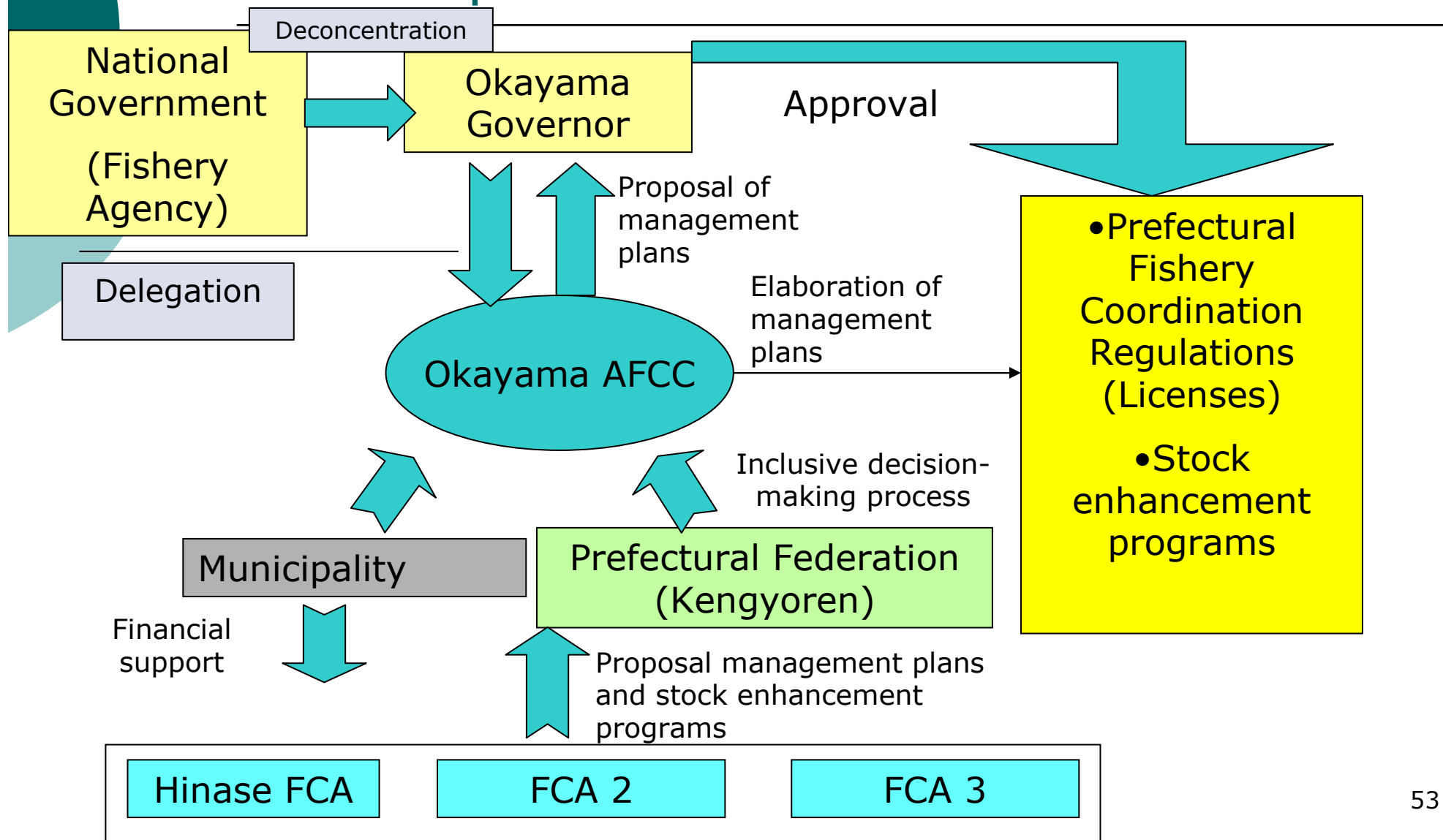
Hinase (日生町)



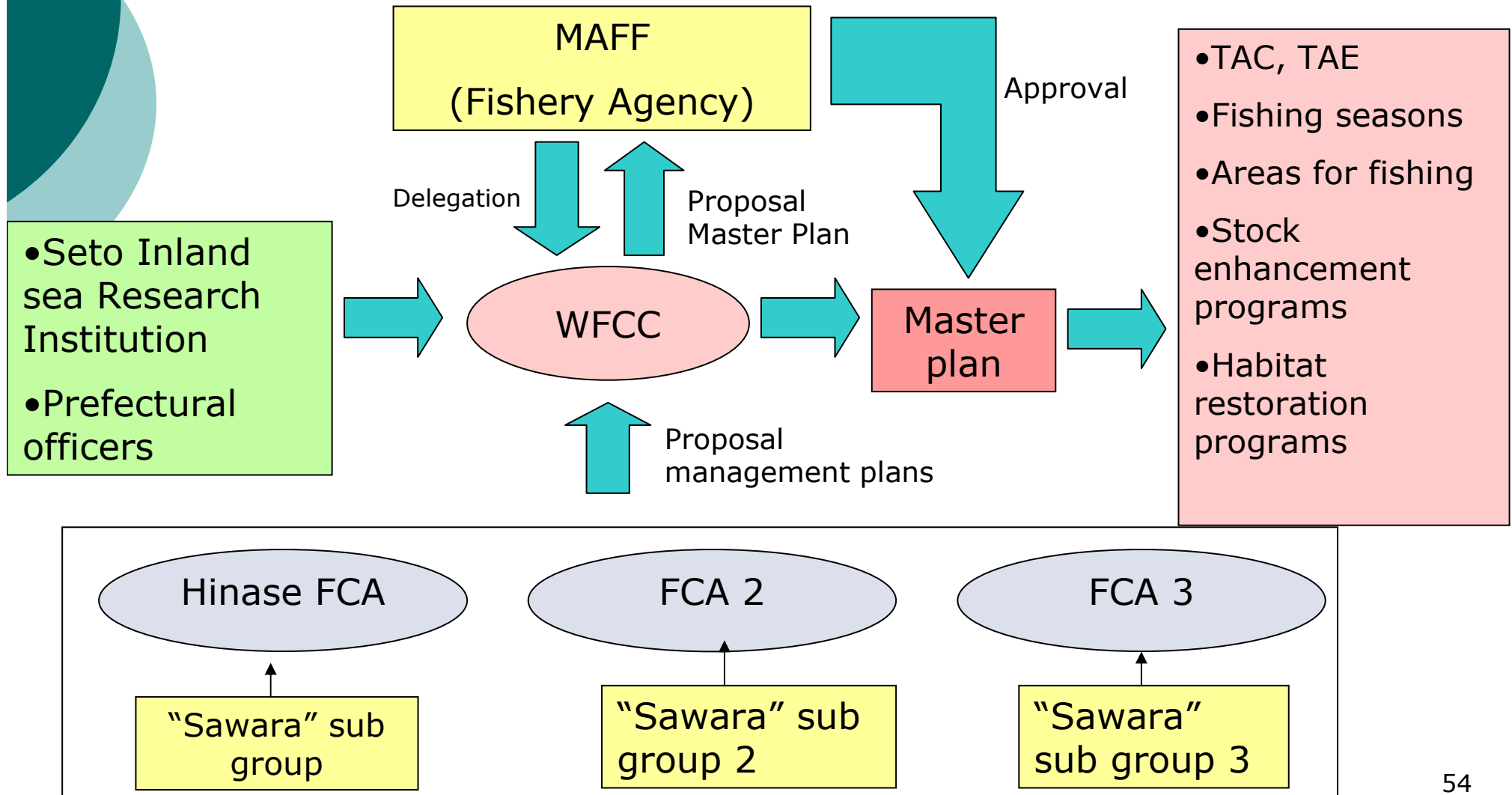
## Trend of amount and value of aquaculture and fisheries informed by Hinase FCA, period 1990 - 2003



# Co-management approach for high mobile species: Case of Hinase FCA



# Framework co-management model for RRP of “Sawara” set by Seto Inland Sea WFCC



## Example of management measures devised by AFCC/WFCC

Sea area of Okayama	Fishing gear	Species	Characteristic of fishing gear
East	Trawl net		Mesh size for shrimp nets are enlarged in 15 units
Central and west	Trawl net		The nets are enlarged in 14 units.
All prefecture	All kind of fishing gear	“Hirame”, Seabream, Black porgy, Rockfish, Eel, Bluecrab, Squilla, “Kuruma” srimp, Tiger puffer	According to the average of 10 fishes is decided the limit of size for fishery. Under this average size the fishes must be released
All prefecture	gill net	“Sawara” Spanish mackerel	Prohibition of fishing during autumn. During spring mesh size of net must be over 3.5
East	gill net	“Sawara” Spanish mackerel	During spring mesh size must be over 3.5. Late spring until autumn, mesh size must be over 2.5. It must be checked the females and released the eggs.
East	Bottom set gill net	“Managatsuo”	It must be checked the females and released the eggs. Mesh size over 4.3
Central	Trawl net	Tiger puffer	Fishing prohibition in October 1 <sup>st</sup> . (2005)
Central	Trawl net, octopus traps	Octopus	During august eggs must be released and is prohibited to fish during September
West	All kind of fishing gear	Blue crab	Fishing prohibition in October 1 <sup>st</sup> . (2005). Under size and eggs must be released
West	All kind of fishing gear	“Ishigani” crab	It is allowed to capture size over 5cm





## Additional management measures set by “Sawara” sub-group in Hinase FCA

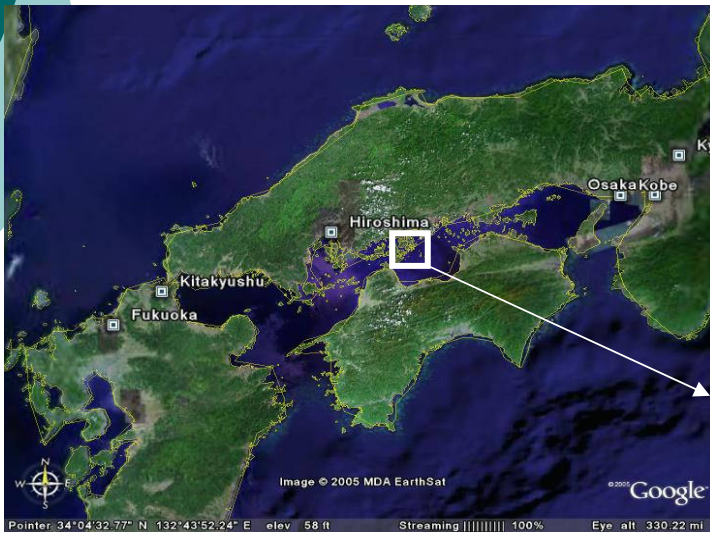
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- Mesh size of gillnet must be over 10.6 cm
- Closed season of fishing during September 1st to November 30th.
- Boats allowed to fish should not exceed 2 tons of capacity
- collection seed of seaweeds in June in order to recovery habitat
- Releasing of 12,000 juveniles (size: 87 – 126 mm) in 2005 financed by Hinase town
- Releasing of 70,000 juveniles (size: 100mm) in 2005 financed by the “ken-saibai” center (Okayama Prefectural Hatchery)



# A Case in Hiroshima Prefecture: Toyohama-cho FCA

## Hiroshima Area, Japan

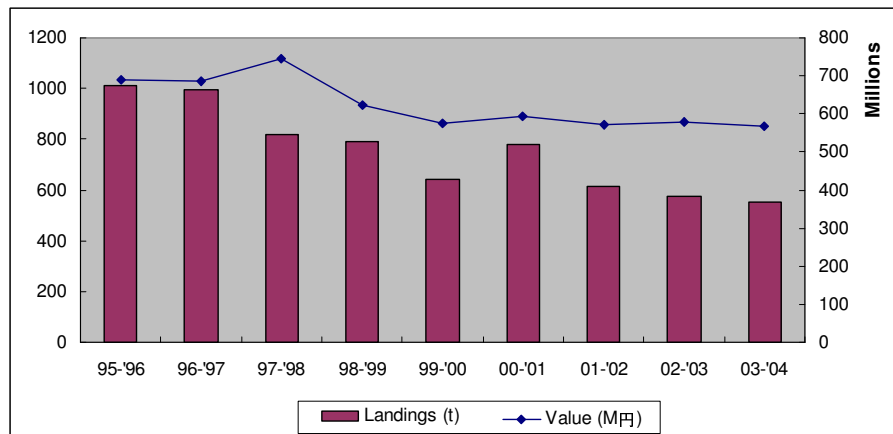


# Toyohama main target species

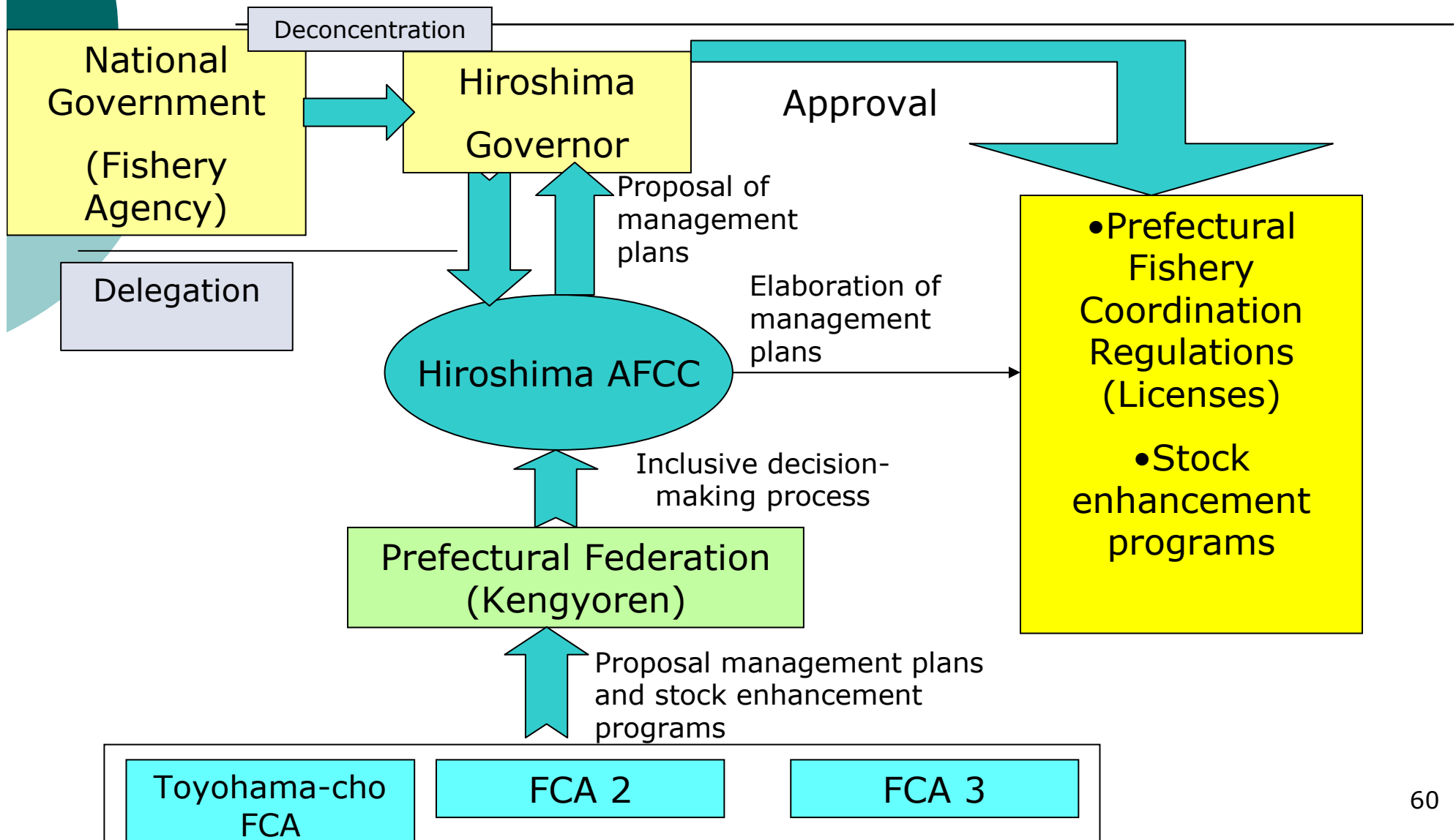
Landings of fishes in Toyohama (t), period 2002-2003		
Japanese name	English name	(t)
Aji	Horse Mackerel	6
Buri	Japanese amberjack	12
Hirame	Bastard halibut	2
Nibe/guchi	Drums and croakers	5
Anago	common eel	39
Hamo	Daggertooth pike conger	7
<b>Tachiuo</b>	<b>Largehead hairtail</b>	<b>576</b>
Ei	Rays	2
Madai	Red seabream	35
Kurodai	Black seabream	3
Suzuki	Japanese seaperch	11
Torafugu	Tiger Puffer	1
Kasago	Common Rockfish	12
Mebaru	Rockfish	6
Kyusen	Snapper	4
<b>Total fishes</b>		<b>736</b>

# Landings and value of Tachiuo in Toyohama

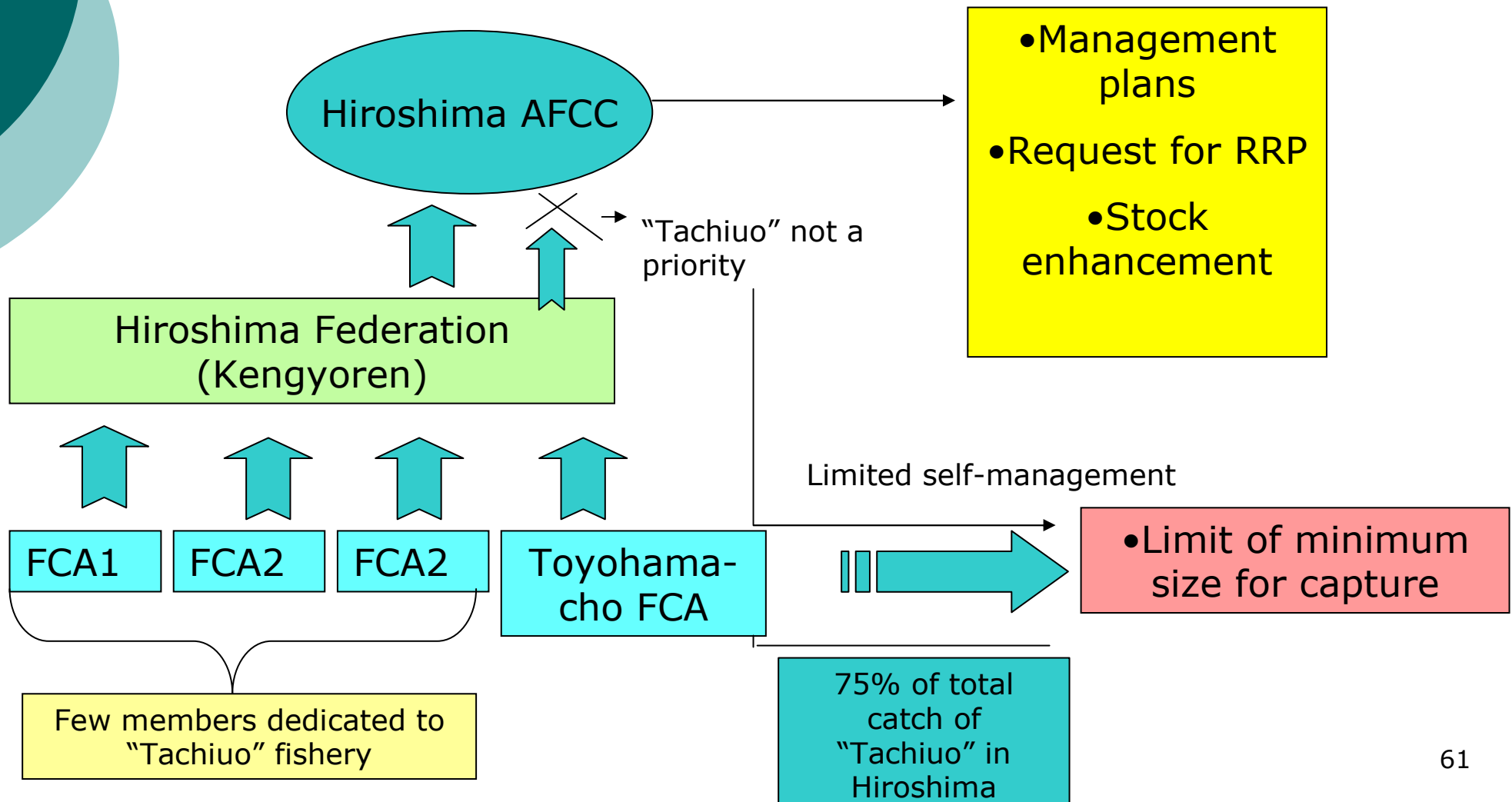
- Toyohama contributes with the 75% of total “Tachiuo” landings of Hiroshima Prefecture



# Co-management approach for high mobile species: Case of Toyohama-cho FCA



# Case of management of “Tachiuo” by Toyohama-cho FCA in Hiroshima



# Summary of findings

- Most of the species in Seto Inland Sea had acceptable levels of sustainability
- Migratory species such as “Sawara” and “Tachiuo” showed low scores in sustainability that can be concordant with their condition of “open access” resources
- Migratory species such as “Sawara” and “Tachiuo” are managed from a co-management approach and it constitutes a unique form of setting input-control measures under a decentralized and participatory approach
- Hinase FCA members not only contribute directly in the elaboration of management plans also conduct several enforcing actions
- Low level of sustainability despite a highly participatory approach can be explained in the case of “Tachiuo” because some obstacles in the decision-making process
- In the case of Sawara since the implementation of RRP it has been a recovery of the resource however is still early to evaluate the effect of WFCC if “sawara” reach its traditional stock levels



# Conclusions

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# Comparison among models

<b>Elements</b>	<b>Nomaike (CBFM)</b>	<b>AME (CBFM/RUBM)</b>	<b>Migratory species (Co-Management)</b>
Common property rights	CFRs	TURFs for diving	Open access resources
Fisheries Resources	Low mobility	Low mobility	High mobility
Fishers organizations	Fishing community	Fishing community/ fishers' organizations	Fishers' organizations
Legislation	High development	Low development	High development
Decentralization	High level	Low level	High level





## Conclusions: Review of decentralization and participation in the fishery policy

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Decentralization and participatory arrangements can be found in different forms depending of several factors

- Japanese system constitute a highly decentralized model while Chilean case still center important decision at central level.
- Common property rights seems fundamental in successful participatory approach
- Low mobility of resources may contribute for successful models
- Fishing community and representative fishers' organization play a fundamental role
- Institutional arrangements linked to an appropriate legislation are necessary for enforcing participatory models



# General Conclusions

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- Coincidence with mostly all CECs with the case of Nomaike may confirm that most of the conditions are suitable in a successful experience.
- AME is a participative model (CBFM/RUBM) with important potential in region 10th, Chile
- Main challenges for AME comes from to achieve actual excludability and reduce subtractability
- Migratory species are managed with input-control measures under a co-management approach
- While western countries focus the management of migratory species through private quotas; in Japan fishers decide what kind of measures must be implemented to recover the target species or to maintain them in a sustainable way.
- Case of “Tachiuo” in relation to Toyohama FCA may indicate problems for efficient decision-making process



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