Conservation and management tools including area-based management

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Information on socioeconomic aspects of Japanese fisheries 1

• Long history of self-imposed (non-government) regulations by fishers’ organizations (for the convenience of enforcement)
• TAC system has introduced in 1997 in Japan, when Japan ratified UNCLOS (with some strong opposition).
• Sudden disappearance of Japanese sardine in just before it (existence of externalities: or even the nature is beyond human control)
Information on socioeconomic aspects of Japanese fisheries 2

- Fishers are placed in economically weak position among supplier (oil and gear), fish buyers (competition with imported fish), financial providers, and so on.
- Social policy: Government fisheries policy?
- After 1990s: lower profitability and declining number of fishers and their boats in Japan
- Fishers’ mistrust against government

Territorial Use Right (not quota) is allocated in Japanese fishery.

- Area for A
- Area for B
- Group allocation (not for individual allocation)
Bottom-up management of Japanese coastal fisheries

Wide variety of species
Central government lacks information on the details of local fisheries

Bottom-up approach
Relevant rules
Speedy decision-making
Easy enforcement
But
Less transparent

Catches in Hokkaido
Catches in Okinawa

Most of the local rules are undocumented, and therefore difficult for outsiders to know.

Japanese fishing control schemes

National laws
Local government regulations, condition for fishing license
Exercise rules of license holder (local fishery cooperatives)
Agreements among small group members within the cooperative (no document)
Example of input controls

Shrimp management areas and no-take zones

Area 1
Area 2
Area 3
Area 4
Area 5
Area 6
Area 7

Notsuke in Hokkaido
Eelgrass (amamo) provides habitats of shrimps.

Self-imposed agreements include restrictions on fishing gear, season, area, and quota (self imposed TAC). Additional habitat restoration activities are also conducted.

Picture: Courtesy of Notsuke fishery cooperative office
Office of a local fishery cooperative association

Characteristics of Management Practice in Notsuke

- Rights-based management for a tenure fishery areas provides incentives for habitat conservation.
- Peer monitoring and sanctions by a fisher’s organization
- Fishers pay attention to ecosystem services such as connectivity of land and sea.
- Fishers are positive toward Ramsar registration.
Existing legal frameworks place too much emphasis on the management of “goods” (i.e., products).

<table>
<thead>
<tr>
<th>Catch Quota based management</th>
<th>Area based management</th>
</tr>
</thead>
<tbody>
<tr>
<td>All attention is on fish and fishing methods. (example: “allowable catch” at UNCLOS 61, or RFMO regulations)</td>
<td>Attention is mostly on habitat conservation (example: territorial use rights fishery managements in Japan)</td>
</tr>
</tbody>
</table>

Recently, more attention is placed on “services” provided by the ecosystem.

- Maintaining ecosystem services (including nutrient cycling and primary production) is one purpose of area-based management activities.
Ecosystem services

- Products obtained from ecosystems
- Benefits such as nutrient cycling
- Cultural services

In Nagoya, Japan, COP10 of CBD in October 2010, Targets toward 2020 was agreed.
The Aichi Target (Para 11)

- By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.

CBD COP9 DECISION 20 (2008)

“Ecologically or Biologically Significant Areas” (EBSAs)

- Uniqueness / rarity
- Special importance for life history of species
- Importance for threatened, endangered or declining species / habitats
- Vulnerability, fragility, sensitivity, or slow recovery
- Biological productivity
- Biological diversity
- Naturalness
FAO Guidelines for Vulnerable Marine Ecosystems (VMEs) FAO,

- Uniqueness or rarity –
- Structural Complexity –
- Functional significance of the habitat –
- Fragility –
- Life-history traits: slow growth rates; late age of maturity; low or unpredictable recruitment; or long-lived

International Maritime Organization (IMO)
Particularly Sensitive Sea Areas (PSSAs)
(A.982(24) Revised guidelines for the identification and designation of Particularly Sensitive Sea Areas (2005))

- PSSA: “an area that needs special protection through action by IMO because of its significance for recognized ecological, socio-economic, or scientific attributes where such attributes may be vulnerable to damage by international shipping activities.”
- Criteria: Significance; Vulnerability to shipping; Available IMO measure
- Principles: Prevention of pollution; precaution; impact on safety and efficiency of navigation
A survey was conducted to collect information of MPAs in Japan.
- 1161 locations of MPAs were identified.
- Of these, 30% are community-based autonomous MPAs managed by fishery cooperatives.
### Institutional characteristics

- Area-based fisheries management has good conformity with MPAs. In fact, 90% of the MPAs in Japan are fishery related regulation.
- If fishing rights are granted to resource users, management incentives arises. In fact, 30% of MPAs are self-imposed regulations agreed by local fishers in their tenure fishing areas.

### Table: Management of MPAs in Japan

<table>
<thead>
<tr>
<th>MPA type</th>
<th>Management authorities</th>
<th>Legal framework</th>
<th>Number of sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine park areas</td>
<td>Ministry of the environment</td>
<td>Natural parks law</td>
<td>82</td>
</tr>
<tr>
<td>Marine special areas</td>
<td>Ministry of the environment</td>
<td>Nature conservation law</td>
<td>1</td>
</tr>
<tr>
<td>Wildlife protection areas</td>
<td>Ministry of the environment</td>
<td>Wildlife protection and appropriate hunting law</td>
<td>23</td>
</tr>
<tr>
<td>Protected waters</td>
<td>Ministry of agriculture, forestry, and fisheries</td>
<td>Act on the protection of fisheries resources</td>
<td>52</td>
</tr>
<tr>
<td>Legally-binding no-take zones</td>
<td>Ministry of agriculture, forestry, and fisheries</td>
<td>Prefectural fishery coordinating regulations</td>
<td>616</td>
</tr>
<tr>
<td>Community-based self-imposed no-take zones</td>
<td>Local fisheries cooperative association (FCA)</td>
<td>Published and unpublished FCA rules</td>
<td>387</td>
</tr>
</tbody>
</table>

Shortcomings of the current international discussions on area-based managements: they lack attention to ecosystem services.

- The five criteria relevant in the identification of a VME at FAO and the seven EBSA criteria of CBD do not specifically mention ecosystem services.
- Not much science on ecosystem services in high sea areas are discussed.

The most recent information tells us ...

(1) Spatial characteristics of ocean ecosystems

![Image of spatial characteristics](image1)

Management units can be identified

(2) Seasonal and yearly changes

![Graphs showing seasonal and yearly changes](image2)

Figures: Courtesy of Chiba S., Yasunaka S., and Hashioka T.
Information exchange among various scientific programs is needed

For instance, our research team started a five year project from 2012 aims to advance our understanding of ocean biogeochemistry and ecosystem dynamics in the Pacific Ocean for the sustainable use of ecosystem services, with particular attention to the high seas.

http://ocean.fs.a.u-tokyo.ac.jp/research-e.html

Scientific outputs on land and sea connections have also been accumulated in the large scale.

Figure: Courtesy of Shiraiwa T.
• Centuries ago, most people stopped hunting terrestrial animals for food.
• In contrast, today’s people are still fishing from the wild on a large industrial scale.
• Where does this difference come from?

The speed of nutrient cycling is much faster in ocean ecosystems than that of land ecosystems

<table>
<thead>
<tr>
<th></th>
<th>Net Primary Production (g/m^2/year)</th>
<th>Existing Biomass (g/m^2)</th>
<th>Production/Biomass (P:B ratio) (/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocean</td>
<td>152</td>
<td>10</td>
<td>15.2</td>
</tr>
<tr>
<td>Land</td>
<td>773</td>
<td>12300</td>
<td>0.063</td>
</tr>
</tbody>
</table>

More attention is needed for ecosystem services beyond areas of national jurisdiction.

It is hard to identify which human activities should be regulated to provide effective conservation of ecosystem services (because land-based activities exist). Thus, designing legally binding instruments will not be easy.

Economic based solutions, such as payment for the ecosystem services or any other mechanisms for providing incentives and peer-sanctions, would be useful under this situation.