The **TASC** (Total Allowable Scallop Culture) an approach for the issue on the overproduction in Yezo giant scallop cultivation in Mutsu Bay

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What is TASC?

**Meaning**

Initial of [Total Allowable Scallop Culture]

(Original word of “Mutsu Bay” in Aomori prefecture)

**Contents**

- Background about TASC
- Estimate of cultivation quantities [from Feed / Income ]
- Coordination for agreement in stakeholders

1,291 fishers and processors

11/12/2010  FISHRIES RESEARCH AJENCY JAPAN
Yezo giant scallop aquaculture in Japan
[type of aquaculture / distribution map]

Mutsu Bay, Aomori pref.
Yezo giant scallop aquaculture in Mutsu Bay
[Map / Temperature / Aquaculture ratio / Species ratio]

Sea temperature change (2008-2009)

Survivable temperature

Actively growth temperature

Survivable temperature

Production ratio in Mutsu Bay
(Date: Aomori prefecture)

Aquaculture ratio
(Annual statistics of Fishery and Fish culture 2008)

Mutsu Bay 41%
Hokkaido 51%
Others 8%

Yezo Giant Scallop
Seacucumber or others

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11/12/2010
Yezo giant scallop aquaculture in Mutsu Bay
[Over cultivation, Low income and Low quality]
Overworking on the sea
[Over cultivation caused the over work] in Mutsu Bay

Interval of hanging facilities

DATE: From TASC investigation (HIROTA, 2007)
Yezo giant scallop aquaculture in Mutsu Bay
[Over cultivation also led mother scallop shortage]

Fig. Changes in annual processing production of each scallop size and age
:Aomori Fisheries Cooperative Association survey

Managerial efficiency: High
Re-productivity: Low
Summary of issue to be solved
[in Mutsu Bay scallop cultivation Industry]

1. Quality loss and unstable of management

2. Overworking on the sea

3. Re-production loss from mother scallop lack
TASC is composed of two analyses:

1. Feed environment / management simulation
2. Income and cost simulation

- **Feed environment**
  1) primary production
  2) inflow of organic substances

- **Income and cost simulation**
  1) price function
  2) cost analysis
Analysis of proper production from feed
Primary production quantity

- Analysis of proper production

Feed environment
1) primary production
2) inflow of organic substances

Scallop culturing capacity in Mutsu Bay

<table>
<thead>
<tr>
<th>Status</th>
<th>2 years shell</th>
<th>1 year shell</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>juvenile</td>
<td>adult</td>
<td>sowing</td>
</tr>
<tr>
<td></td>
<td>748</td>
<td>342</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>483</td>
<td></td>
<td>140</td>
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<tr>
<td></td>
<td>1,573</td>
<td>303</td>
<td>1,060</td>
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</tbody>
</table>

Yoshida, Kosaka (2002) Aomori Fisheries research center
Aquaculture Institute
Analysis of proper production from feed inflow organic substances

- Analysis of proper production
- Feed environment
  1) primary production
  2) inflow of organic substances

Total Allowable Scallop Culture capacity
83,711(ton) + 5,860(ton) = 89,571(ton)

Primary Inflow

Fig. Rate of inflow organic and primary production

TASC system report 2009: Aomori Prefecture Fisheries Institute)
Calculation of proper production from management
Production function

1) Production function
2) Cost analysis

Income and cost simulation

Analysis of correlation
production quantities and
each Price

Result of Multiple regression

<table>
<thead>
<tr>
<th>Partial regression coefficient</th>
<th>Juvenile</th>
<th>Adult</th>
<th>Sowing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aomori production</td>
<td>-0.00269</td>
<td>-0.00080</td>
<td>-</td>
</tr>
<tr>
<td>Hokkaido sowing</td>
<td>-</td>
<td>-0.00054</td>
<td>-0.00124</td>
</tr>
<tr>
<td>Hokkaido hanging</td>
<td>-</td>
<td>-0.00077</td>
<td>-</td>
</tr>
<tr>
<td>Adult production</td>
<td>-</td>
<td>-</td>
<td>-0.00351</td>
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<tr>
<td>Constant</td>
<td>388.559</td>
<td>474.868</td>
<td>557.938</td>
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<tr>
<td>Adjust R^2</td>
<td>0.91987</td>
<td>0.8854</td>
<td>0.7816</td>
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<tr>
<td>SE</td>
<td>5.8023</td>
<td>8.3085</td>
<td>13.6774</td>
</tr>
</tbody>
</table>

Dependent variable

Production quota (variable)

=Total quantity simulation

TASC system report 2009:Aomori Prefecture Fisheries Institute)
Calculation of proper production from management
Cost Analysis

1) Production function
2) Cost analysis

Analysis of cost curve

Production Curve
Cost Curve

Max Income Level
85,000 ton

TASC system report 2009:Aomori Prefecture Fisheries Institute

TASC system report 2009:Aomori Prefecture Fisheries Institute
Process to agreement for stakeholders

2007.5～2008.4
- Researchers
- Prefectural government
- Meeting 23 times

2008.4～2008.6
- Fisheries cooperative Association
- Sectional meeting
- Meeting 20 times

Term of agreements
- Total quantities (ton) 90,000
- Adult scallop (ton) 20,000
- Shift period 2 years
- Distribution rate X

Participants: 840 peoples
All concerned: 1,291 entrepreneurs

Implemented in 2010. Feb

TASC system report 2009: Aomori Prefecture Fisheries Institute

11/12/2010
Summary

1. TASC has bio and economic grounds
   [Feed environment, income and expense balance]

2. Implementation on Exercise Regulation for Fishery Right

Fisheries Cooperation applying permission government

2010 Feb start