FISHERIES CO-MANAGEMENT: AN EFFECTIVE COASTAL FISHERY MANAGEMENT IN THAILAND

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Thai fisheries

- Fishery product exporter
- Fishing nations, with degraded fishery resources in Thai waters
- Problems in effective fishery management
- Impact on small scale coastal fisheries
- Adoption of CBFM and Co-management
- Key indicators for success of CBFM/CM
  - Legal framework
  - Boundaries
  - Community organization
Fisheries in Thai economy

- Total volume 3.8 million ton
- 47% fish volume

- Total value US$ 2.9 billion
- 55% shrimp value

- 2% of total GDP
- 15% of agricultural GDP
- 10% of food consumption
Thai fisheries in the world trade

- Production
  Rank 9th Share 3%
- Export Quantity
  Rank 6th Share 4%
- Export Value
  Rank 23th Share 1%
Development of Thai fisheries (1)

- 1925...Introduction of Chinese purse seine
- 1930...Develop purse seine, using Japanese engine, fishing pelagic species mainly Indo-Pacific mackerel
- 1959...Introduction of otter board trawl
- 1961...CPUE was 298 kg/hr.
- 1963...Rapid increase in trawlers and push netters
Development of Thai fisheries (2)

- 1968...fishing vessels of 24 m long and over fished outside Thai waters, small vessels turned to squid fisheries
- 1972...Thailand was ranked as the top ten fishing countries for the first time, over fishing trawl fisheries, CPUE decreased to 63 kg/hr.
- 1973...Development of light luring and fish attractive device purse seines
- 1977...Catches reached more than 2 mill. ton, then decreased. Over fishing in main economic pelagic species
Development of Thai fisheries (3)

• 1979-1981...EEZ
• 1982...Catches increased but fluctuating
• 1983...Catches increased to 2 mill. ton
• 1989...CPUE decreased to 20 kg/hr.
• 1996…Increasing fishing outside Thai waters
• 2005…CPUE decreased to 12 kg/hr.
Trend of fishery production

Quantity (thousand ton)  Value (million US$)
Composition change in Thai marine captures 1982, 1992 and 2002
Problems in Thai marine fisheries

• Fishery resource degradation
• Number of fishing vessels
• Illegal and destructive fishing
• Commercial VS coastal fisheries
• Fishing cost
## Maximum sustainable yields in Thai fishing grounds and marine catches (thousand ton)

<table>
<thead>
<tr>
<th>Item</th>
<th>Gulf of Thailand</th>
<th></th>
<th>Andaman Sea</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MSY</td>
<td>Catch</td>
<td>MSY</td>
<td>Catch</td>
</tr>
<tr>
<td>Pelagic fish</td>
<td>400</td>
<td>646</td>
<td>50</td>
<td>187</td>
</tr>
<tr>
<td>Indo-Pacific mackerel</td>
<td>&gt;62</td>
<td>116</td>
<td>20</td>
<td>31</td>
</tr>
<tr>
<td>Scad</td>
<td>110</td>
<td>71</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>Indian mackerel</td>
<td>32</td>
<td>17</td>
<td>na</td>
<td>16</td>
</tr>
<tr>
<td>Tuna</td>
<td>&gt;25</td>
<td>105</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Trevellies</td>
<td>na</td>
<td>39</td>
<td>na</td>
<td>9</td>
</tr>
<tr>
<td>Sardinellas</td>
<td>150</td>
<td>108</td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>Demersal fish</td>
<td>750</td>
<td>924</td>
<td>200</td>
<td>488</td>
</tr>
<tr>
<td>Squid</td>
<td>41</td>
<td>70</td>
<td>na</td>
<td>19</td>
</tr>
</tbody>
</table>
### Number of vessels as reported by Marine Fishery Census

<table>
<thead>
<tr>
<th>Year</th>
<th>Total vessels</th>
<th>Inboard engine</th>
<th>Outboard engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>53,457</td>
<td>16,982</td>
<td>36,475</td>
</tr>
<tr>
<td>1995</td>
<td>54,538</td>
<td>15,282</td>
<td>39,256</td>
</tr>
<tr>
<td>2000</td>
<td>58,119</td>
<td>13,263</td>
<td>44,856</td>
</tr>
</tbody>
</table>
Income of small scale fishing household (1)

Small scale fishing income, 2000 (US$/hh/yr)

<table>
<thead>
<tr>
<th></th>
<th>total</th>
<th>shrimp gill net</th>
<th>crab gill net</th>
<th>mullet gill net</th>
<th>push net</th>
<th>poverty line</th>
<th>av h/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>income</td>
<td>1,898</td>
<td>1,855</td>
<td>1,849</td>
<td>1,865</td>
<td>2,485</td>
<td>1,769</td>
<td>2,575</td>
</tr>
</tbody>
</table>
Income of small scale fishing household (2)

Small scale fishing income, 2004 (US$/hh/yr)

<table>
<thead>
<tr>
<th></th>
<th>otter board</th>
<th>push net</th>
<th>poverty line</th>
<th>av h/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>income</td>
<td>1,449</td>
<td>3,126</td>
<td>1,917</td>
<td>4,281</td>
</tr>
</tbody>
</table>
Government and fishery management

• Fishery resource management
  – Attempts on control number of vessels
  – Gear restriction
  – Season & area closure
  – CBFM/CM, strengthening local capacity

• Renewal fishery resource abundance
  – Environment control
  – Renewal fishing grounds

• Fishery occupation development
  – HRD for fishing efficiency and collective organization
Poverty eradication (1)

• Commercial fisheries
  – Reducing number of vessels
  – Register outside Thai water vessels
  – Information for determination on optimum level of fishing
  – Collaboration from the fishermen
Poverty eradication (2)

• Small scale fisheries
  – CBFM
  – Co-management
  – Community organization capacity
  – Fishing right:
    • fishing ground
    • community (organization and members)
    • fishing right
    • establishing community organization and management capacity
    • collaboration with relevant agencies
Economic instrument for marine fishery resource management

- Problem of resource management
  - Market failure
  - Lack of clearly defined property right
  - Externalities

- Economic instruments
  - Tradable permit
  - Bond and deposit refund
  - Granting property right regime
  - Liability system
  - Fiscal instrument
  - Financial instrument
  - Charge system
## Criteria of economic instruments for selected Thai marine fishery resources

<table>
<thead>
<tr>
<th>Item</th>
<th>Practice</th>
<th>Management Administration</th>
<th>Technique</th>
<th>Acceptability</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Data</td>
<td>Enforcement</td>
<td>Monitoring</td>
<td>Cost</td>
</tr>
<tr>
<td>Tradable permit</td>
<td>p</td>
<td>C</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Granting right</td>
<td>r</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Liability system</td>
<td>r</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Fiscal instrument</td>
<td>p</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td>Financial instrument</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Charge system</td>
<td>r</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>B</td>
</tr>
</tbody>
</table>

Note: Indicators for possibility and suitability are A= High, B= Moderate, C=Low
r = available/relevant but difficult to determine the level of A/B/C
i= irrelevant or not suitable
and p = not available yet but possible to be applied.
## Commercial fisheries

<table>
<thead>
<tr>
<th><strong>Target</strong></th>
<th>Renewal fishery resource abundance by reducing fishing effort to the optimum level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economic instrument</strong></td>
<td>Granting fishing right through tradable permit on fishing quota</td>
</tr>
</tbody>
</table>
| **Operation** | Determine individual fishing quota  
Quota allocation on basis of fishing vessels  
Improve landing facilities to support quota control. |
| **Responsible agencies** | Department of Fisheries  
Fish Market Organization  
Harbor Department  
Local Authority  
Thai Fisheries Association |
<p>| <strong>Relevant measure</strong> | Liability system and charge system, at rational fee |</p>
<table>
<thead>
<tr>
<th>Coastal fisheries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target</strong></td>
</tr>
<tr>
<td>Renewal resource abundance for sustainable utilization among coastal communities</td>
</tr>
<tr>
<td><strong>Economic instrument</strong></td>
</tr>
<tr>
<td>Community based fishery management/Co-management</td>
</tr>
<tr>
<td><strong>Operation</strong></td>
</tr>
<tr>
<td>Granting fishing right to appropriate coastal fishing communities according to justified physical, legal, and social conditions</td>
</tr>
<tr>
<td><strong>Responsible agencies</strong></td>
</tr>
<tr>
<td>Department of Fisheries</td>
</tr>
<tr>
<td>Local Administration Authority</td>
</tr>
<tr>
<td><strong>Relevant measures</strong></td>
</tr>
<tr>
<td>Strengthening local fishery management capacity</td>
</tr>
<tr>
<td>Government support on enforcement</td>
</tr>
</tbody>
</table>
Key factors for CBFM/CM in Thailand

• Physical conditions
  – Fishery resources
    • Degraded, mainstay, indigenous knowledge
    • Sedentary
  – Fishing ground
    • Exclusivity
    • Barriers
  – Fishing activities
    • Multi-species, multi-gear
    • Heterogeneity
Key factors for CBFM/CM in Thailand (2)

• Institutional framework
  – Law and regulation
    • Fishery law 1947
    • Section 7 grants provincial committee the authority under approval of the Ministry to announce specific fishing as sanctuary/auction/permissions.
  – Village organization
    • Sub-district Administration Authority - TAO
    • Fishery dominance
    • Village organization
    • Norms, customs, and religion
Key factors for CBFM/CM in Thailand (3)

• Fishing right
  – Granting the right
  – Pilot project
  – Support on enforcement

• Basic infrastructures
  – Public provision (landing piers, fishing gear repair shop, coastal rehabilitation via artificial reef)
  – Technical extension on appropriate gears
  – Enhancement and Conservation of Natural Environmental Quality Act 1992 (support on collaboration among the local, NGO, PO and relevant gov’t agencies)
  – CEO governor, TAO
Key factors for CBFM/CM in Thailand (4)

• Socio-economic condition
  – Artisanal/small-scale fisheries
  – Long history of fishing
  – Indigenous knowledge
  – Community organization
  – Financial support (during the period of resource rehabilitation, to increase participation)
  – Market outlet to lessen the debt-tied with the traders
Checkpoints for adopting CBFM/CM

- Benefits and beneficiaries
- Community needs and capacity
- Needed changes in physical and capacity, at community level
- Community key persons and their roles
- Roles of supportive agencies, Go as well as NGOs
- Appropriate outreach program -- empowerment and extension
- Investment for building up community capacity in effective fishery management
Development of CBFM/CM in Thailand

- CBFM in Phang-Nga Bay (FAO-BOBP/DOF) early 1990s
  - Information on fishing villages
  - CBFM implementation

- Small-scale fishery development project (DOF) 1990s
  - Infrastructures, local saving group
  - Co-management

- CHARM (EU/DOF) 2000s
  - Ecosystem
  - Human resource development
  - Community organization - TAO
Map of Thailand
Land use in Ban Pa Klog, Andaman Coast

- **Agricultural Zone**
  - Paddy field
  - Fruit orchard
  - Para rubber/oil palm plantation
  - Coconut plantation
  - Aquaculture

- **Forest Zone**
  - Conserved forest
  - Economic forest “Gor”
  - Economic forest “Khor”

- **Urban Area**
  - Conserved Area
  - Islands
  - Mountain

- **Water**
Land use in Takien Thong, Ban Don Bay

Agricultural Zone
- Paddy field
- Fruit orchard
- Para rubber/oil palm plantation
- Coconut plantation

Aquaculture

Forest Zone
- Conserved forest
- Economic forest “Gor”
- Economic forest “Khor”

Urban Area

Conserved Area

Islands

Mountain

Water
Economic valuation for coastal fishing villages

**ECONOMIC VALUE**

**USE VALUE**
- Direct Use Value
  - Captured fishery (market value)
  - Produces from mangroves (market value)
  - Agricultural production (market value)
- Indirect Use Value
  - Mangrove ecological functions (cost-side approach/surrogate market/Market value)
  - Recreation/tourism (surrogate market/CVM)

**NON-USE VALUE**
- Option Value
  - Biodiversity (surrogate market/CVM/choice model/conditional value of information)
  - Culture/heritage (surrogate market/CVM/choice model)
- Existence/Bequest Value
  - Biodiversity (surrogate market/CVM/choice model/conditional value of information)
  - Culture/heritage (surrogate market/CVM/choice model)
Building up capacity of coastal fishing communities

- To collect the information
  - Data collection and in-depth interview with local administrators, key informants, GO and NGO at sub-district (tambon) level
  - Identify the selected village
  - RRA, in-depth interview with the village headman, occupation group leaders, key informants
  - Questionnaire interview with the relevant villagers

- Information on
  - GIS, geographical location, resource utilization
  - Development and impacts on community
  - Conflicts in coastal resource utilization
  - Economic dependence on coastal habitats
  - Collaboration at community level
  - Community perspective
  - Community organization
CHARM footprint

• Five key attributes to be kept in good balance
  – Participation
  – Partnership
  – Building capacity
  – Learning and adaptation
  – Integrated approaches and method

Source: Cowling, 2005. CHARM Co-management Manual
Source: Cowling 2005, CHARM Co-management Manual
THANK YOU