Purse Seine Fisheries in Thailand

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Outline

1. Introduction
2. Catch and effort statistics
3. Biological information
4. Status of pelagic fish stock
5. Existing management strategies
1. Introduction
Thailand

- 23 coastal provinces
- Coastline: 2,614 km along Gulf of Thailand (GOT) and Andaman Sea (ANS)
- Total EEZ: 420,280 km²

Marine capture fisheries in Thailand

- Landing: > 1.1 million t of catch in 2016
- Involving 0.68 million people
Capture production of Thailand by fishing gear in 2016

- Trawl: 50%
- Purse seine: 35%
- Gillnet: 5%
- Others*: 10%

*Consist of falling net, push net, lift net, traps, hook and line, etc
Purse seine fishing in Thailand

- Thai purse seine (TPS)

- Anchovy purse seine (APS)

Source: AFMA (2018)
TPS (*Uan dum = Black seine*)

- Net: PA (polyamide) with black colour
- Length of float-line: 400-1,800 m
- Net depth: 60-110 m
- Mesh size: ≥ 25 mm
• Fishing techniques can be divided into 3 operation types
  - Free school (FS)
  - Light luring (LL)
  - Fish aggregating device (FAD)

• Catch: Indo-Pacific mackerel, Indian mackerel, sardine, scads, bonitos, black pomfret and ponyfish
• Net: PA (knotless) with green or brown colour
• Length of float-line: 250-450 m
• Net depth: 15-80 m
• Mesh size: > 6 mm
• 2 types of anchovy purse seiners
  - Fishing boat without boiler
  - Fishing boat with boiler

• Catch: anchovies
Fishing areas

- Main fishing grounds are located in GOT and ANS

- Depth of fishing grounds for both Thai and anchovy purse seines is < 100 m
2. Catch and effort statistics
Total landing (t) by all purse seiners
Total landing (t) from GOT

Landing (t)

ALL

TPS

APS
Total landing (t) from ANS
Number of purse seine vessels

Number of vessels

--- TPS
-- APS
Number of purse seine vessels in GOT

Number of vessels

- TPS
- APS

Years:
Number of purse seine vessels in ANS

Number of vessels

--- TPS
--- APS
Number of fishing days/trip in GOT

Days/trip


TPS

APS
Number of fishing days/trip in ANS
Number of hauls/day in GOT

Hauls/day


TPS

APS
Number of hauls/day in ANS

Hauls/day

- - - TPS
--- APS

0  2  4  6  8  10

Catch per unit effort (CPUE) in GOT
Catch per unit effort (CPUE) in ANS

![Graph showing CPUE over time with two lines, one for TPS and one for APS. The CPUE is measured in t/day, and the time frame spans from 1996 to 2016.]
3. Biological information
Species composition

**TPS - GOT**

**TPS - ANS**

**APS - GOT**

**APS - ANS**

- Indian mackerel
- Indo-Pacific mackerel
- Bonitos
- Scads
- Anchovies
- Others: king mackerel, mullets, trevallies, pomfrets, croakers, breams, sardines, squids, crustaceans, etc

- Indian mackerel
- Indo-Pacific mackerel
- Bonitos
- Scads
- Anchovies
- Others: king mackerel, sardines, squids
## Length at 1\textsuperscript{st} maturity of female

<table>
<thead>
<tr>
<th>Species</th>
<th>Total length (cm)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GOT</td>
<td>ANS</td>
</tr>
<tr>
<td><em>Rastrelliger brachysoma</em></td>
<td>17.95</td>
<td>15.33</td>
</tr>
<tr>
<td><em>Rastrelliger kanagurta</em></td>
<td>17.12</td>
<td>18.92</td>
</tr>
<tr>
<td><em>Sardinella gibbosa</em></td>
<td>10.35</td>
<td>13.12</td>
</tr>
<tr>
<td><em>Decapterus maruadsi</em></td>
<td>13.19</td>
<td>15.66</td>
</tr>
<tr>
<td><em>Selar crumenophthalmus</em></td>
<td>18.25</td>
<td>19.95</td>
</tr>
<tr>
<td><em>Encrasicholina punctifer</em></td>
<td>6.51</td>
<td>6.47</td>
</tr>
<tr>
<td><em>Encrasicholina heteroloba</em></td>
<td>7.49</td>
<td>6.44</td>
</tr>
<tr>
<td><em>Encrasicholina devisi</em></td>
<td>7.81</td>
<td>7.21</td>
</tr>
</tbody>
</table>

\(a\) Krajangdara et al. (2007); \(b\) Nasuchon et al. (2010); \(c\) Krajangdara and Chalee (2004); \(d\) Hussadee et al. (2015); \\(e\) Supongpan et al. (2003); \(f\) Phuttharaksa et al. (2008); \(g\) Chalee and Yakoh (2013); \(h\) Sinanun et al. (2012); \\(i\) Yakoh et al. (2014); \(j\) Nasuchon and Puntuleng (2005)
## Spawning Season

<table>
<thead>
<tr>
<th>Species</th>
<th>Peak season</th>
<th>GOT</th>
<th>ANS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rastrelliger brachysoma</td>
<td>Feb-May/Jul-Oct</td>
<td>Nov-May/Jul-Sep</td>
<td></td>
</tr>
<tr>
<td>Rastrelliger kanagurta</td>
<td>Jan-Mar/May/Jul/Sep/Nov</td>
<td>Dec-Mar/Aug-Sep</td>
<td></td>
</tr>
<tr>
<td>Sardinella gibbosa</td>
<td>Mar-Dec</td>
<td>Apr-Jun/Aug-Sep/Nov-Jan</td>
<td></td>
</tr>
<tr>
<td>Decapterus maruadsi</td>
<td>Jan-Mar/May-Jul</td>
<td>Dec-Feb</td>
<td></td>
</tr>
<tr>
<td>Selar crumenophthalmus</td>
<td>Mar-Jun/Oct-Nov</td>
<td>Sep</td>
<td></td>
</tr>
<tr>
<td>Encrasicholina punctifer</td>
<td>N.A.</td>
<td>Jan</td>
<td></td>
</tr>
<tr>
<td>Encrasicholina heteroloba</td>
<td>Nov-Jan</td>
<td>Jul</td>
<td></td>
</tr>
<tr>
<td>Encrasicholina devisi</td>
<td>N.A.</td>
<td>Jun</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)Krajangdara et al. (2007); \(^b\)Nasuchon et al. (2010); \(^c\)Krajangdara and Chalee (2004); \(^d\)Hussadee et al. (2015); \(^e\)Supongpan et al. (2003); \(^f\)Phuttharaksa et al. (2008); \(^g\)Chalee and Yakoh (2013); \(^h\)Yakoh et al. (2014); \(^i\)Munprasit (1996)
## Growth and mortality parameters

<table>
<thead>
<tr>
<th>Species</th>
<th>(L_\infty) (cm)</th>
<th>(K) (year(^{-1}))</th>
<th>(T_0) (year)</th>
<th>(Z) (year(^{-1}))</th>
<th>(M) (year(^{-1}))</th>
<th>(F) (year(^{-1}))</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rastrelliger brachysoma</strong>(^a)</td>
<td>22.00</td>
<td>2.50</td>
<td>-0.003</td>
<td>6.12</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td><strong>Rastrelliger kanagurta</strong>(^b)</td>
<td>26.98</td>
<td>1.60</td>
<td>-0.003</td>
<td>5.32</td>
<td>2.56</td>
<td>2.76</td>
</tr>
<tr>
<td><strong>Sardinella gibbosa</strong>(^c)</td>
<td>21.68</td>
<td>1.61</td>
<td>-0.007</td>
<td>9.91</td>
<td>2.21</td>
<td>7.70</td>
</tr>
<tr>
<td><strong>Decapterus maruadsi</strong>(^d)</td>
<td>27.75</td>
<td>1.01</td>
<td>0.000</td>
<td>6.43</td>
<td>1.89</td>
<td>4.54</td>
</tr>
<tr>
<td><strong>Selar crumenophthalmus</strong>(^e)</td>
<td>28.40</td>
<td>1.87</td>
<td>0.000</td>
<td>7.03</td>
<td>2.22</td>
<td>4.81</td>
</tr>
<tr>
<td><strong>Encrasicholina punctifer</strong>(^f)</td>
<td>10.80</td>
<td>1.85</td>
<td>-0.011</td>
<td>11.35</td>
<td>2.90</td>
<td>8.45</td>
</tr>
<tr>
<td><strong>Encrasicholina Heteroloba</strong>(^f)</td>
<td>10.60</td>
<td>1.70</td>
<td>-0.011</td>
<td>10.91</td>
<td>2.76</td>
<td>8.15</td>
</tr>
<tr>
<td><strong>Encrasicholina devisi</strong>(^f)</td>
<td>10.54</td>
<td>1.80</td>
<td>-0.011</td>
<td>9.59</td>
<td>2.88</td>
<td>6.72</td>
</tr>
</tbody>
</table>

\(^a\)Sinanun et al. (2012); \(^b\)Thongsila et al. (2012) \(^c\)Boonjorn et al. (2013) \(^d\)Yamrungrueng et al. (2018) \(^e\)Khemakorn et al. (2015); \(^f\)Boonsuk et al. (2010)
4. Status on pelagic fish stock
### Maximum sustainable yield (MSY) vs Catch (MFRDD, 2018)

<table>
<thead>
<tr>
<th>Group</th>
<th>Area</th>
<th>MSY (t) (A)</th>
<th>Catch (t) (B)</th>
<th>(B)/(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelagic fishes</td>
<td>GOT</td>
<td>250,739</td>
<td>199,507</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>ANS</td>
<td>118,755</td>
<td>121,400</td>
<td>1.02</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>369,494</td>
<td>320,907</td>
<td>0.87</td>
</tr>
<tr>
<td>Anchovies</td>
<td>GOT</td>
<td>201,564</td>
<td>108,212</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>ANS</td>
<td>33,194</td>
<td>13,570</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>234,758</td>
<td>121,782</td>
<td>0.52</td>
</tr>
</tbody>
</table>
5. Existing management strategies
Management measures

• New Fisheries Acts (Royal Ordinance on Fisheries) have been established in 2015 and revised in 2017

• Regulations for marine capture were updated

• For purse seine, the regulations are enforced to control the gear and effort

• Vessel owners must renew their fishing license every 2 years
• **Mesh size:** $\geq 25$ mm for TPS and $> 6$ mm for APS

• **Fishing time:** only daytime operation is allowed for APS

• **Closed seasons:** 4 periods in GOT and 1 period in ANS

• **Closed areas:** Trad Bay for LL operation of TPS and coastal zone announced by each coastal province
Thank you for your kind attention
Literature Cited


