Thailand Fisheries Development:
Experience with reservoir fisheries, fish passages and captive breeding, and use of the Mekong for fisheries

Suchart Ingthamjitr
Programme Officer, Fisheries Programme

MRC SEA OF HYDROPOWER ON THE MEKONG MAINSTREAM
THAI NATIONAL SCOPING WORKSHOP
14 August 2009
Bangkok, Thailand
Rice and fish are staple diets of Thai since in the past
Reservoir fisheries

- The major dams and reservoirs in the Mun/Chi watershed completed before the year 1994 (MRC, 1997)

<table>
<thead>
<tr>
<th>Name</th>
<th>Primary purpose</th>
<th>Year of impoundment</th>
<th>Reservoir area at upper storage level (km²)</th>
<th>Catchment area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ubolratana</td>
<td>Hydroelectricity</td>
<td>1965</td>
<td>410</td>
<td>12,000</td>
</tr>
<tr>
<td>Sirinthorn</td>
<td>Hydroelectricity</td>
<td>1971</td>
<td>288</td>
<td>2,097</td>
</tr>
<tr>
<td>Chulaporn</td>
<td>Hydroelectricity</td>
<td>1972</td>
<td>12</td>
<td>545</td>
</tr>
<tr>
<td>Lam Pao</td>
<td>Irrigation</td>
<td>1966</td>
<td>400</td>
<td>5,964</td>
</tr>
<tr>
<td>Lam PhraPhloeng</td>
<td>Irrigation</td>
<td>1973</td>
<td>19</td>
<td>807</td>
</tr>
<tr>
<td>Lam Takhong</td>
<td>Irrigation</td>
<td>1968</td>
<td>45</td>
<td>1,430</td>
</tr>
<tr>
<td>Lam Nang Rong</td>
<td>Irrigation</td>
<td>1968</td>
<td>25</td>
<td>453</td>
</tr>
<tr>
<td>Pak Mun</td>
<td>Hydroelectricity</td>
<td>1994</td>
<td>60</td>
<td>117,000</td>
</tr>
</tbody>
</table>

- Several other thousand small dams and weirs

- Impact of dams on river and floodplain fish production but offer reservoir fisheries
Productions and composition

Variation of fish production and species composition in different reservoirs depends on:

- inhabited fishes in the river before impoundment,
- aquatic ecosystem of the reservoir,
- watershed and land use,
- fisheries management such as fishing control and stocking programme
## Ubolratana reservoir

### Change of fish after impoundment in 1965

<table>
<thead>
<tr>
<th></th>
<th>before</th>
<th>after</th>
<th>remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>no. of species</td>
<td>76</td>
<td>52</td>
<td>one year after imp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>67-68</td>
<td>After 6-8 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>67</td>
<td>1998-2000</td>
</tr>
<tr>
<td>Yield (kg/ha)</td>
<td>117.5</td>
<td>177.7</td>
<td>one year after imp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>114, 172</td>
<td>1975, 1982</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40.5</td>
<td>1998-2000</td>
</tr>
<tr>
<td>Fish guild</td>
<td></td>
<td>Carps ↓</td>
<td>then plankton feeder and herbivores</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carnivores ↑</td>
<td></td>
</tr>
</tbody>
</table>

Source: after Interim Committee for Coordination of Investigations of the Lower Mekong Basin, 1992
Permanent loss species in the reservoir

- *Labeo bicolor*
- *Wallagonia attu*
- *Bagarius bagarius*
- *Kryptopterus cryptopterus*
- *Kryptopterus apogon*
- *K. bleekeri*
## Study in 1998-2000

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of fishing households</th>
<th>Number of fishing gear</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>gill net</td>
</tr>
<tr>
<td>1970</td>
<td>1,060</td>
<td>12,320</td>
</tr>
<tr>
<td>1973</td>
<td>1,379</td>
<td>7,850</td>
</tr>
<tr>
<td>1983</td>
<td>3,905</td>
<td>14,485</td>
</tr>
<tr>
<td>1992</td>
<td>4,870</td>
<td>31,160</td>
</tr>
<tr>
<td>2000</td>
<td>&gt;5,000</td>
<td>39,860</td>
</tr>
</tbody>
</table>

- Population increased from 1,060 in 1970 to over 5,000 in 2000
- Majority is subsistence fishers use of gill net, lift net, cast net, dip net/scoop net and hook, but gill net and hooks are the most popular, use of gear varies seasonally.
found 67 species but only 21 economically important species
There are 8 fishways and mainly Pool and Weir design.

- 5 in the LMB
- 1 in the north
- 1 in the centre
- 1 in the south
- Main fishes passing the fishways are River Carp (Cyprinidae) and Loaches (Cobitidae)
The fishways were not the best pool-type design for tropical species, a vertical slot design is more effective. Pak Mun is too high for a pool-type fishway. Fishways need to be built as part of fish passage planning. **Regular monitoring** is needed to show the effectiveness of any fishways. And how to monitor properly? We have a *law*, and a policy but not a clear implementation. **Cooperation** is poor among agencies who are involved in water management and no co-operation at all for local authority and local communities, especially in managing fishway activities.
Captive breeding

Has long been developed

Cooperation and assistance from abroad and international organizations encourage development

16 fisheries stations/centre throughout Thai Mekong River Basin produced about $600-700 \times 10^6$ annually;

- 550 million fish fries and 100 million giant prawn
- indigenous : exotic species = 70% : 30%
- releasing : aquaculture = 95% : 5 %
Successful bred indigenous fishes

- Pangasianodon hypophthalmus
- Pangasianodon gigas
- Kryptopterus bleekeri
- Micronema apogon
- Mystus filamentus
- Hemibagrus wyckioides
- Wallago leeri
- Pangasius sanitwongsei
- Bagariys bagarius
- Labeo chrysophekadion
- Catlocarpio siamensis
- Probarbus jullieni
Thailand’s use of the Mekong for fisheries

Thai-Mekong boundary

The major fisheries activities in Thai-Mekong Basin

- Giant catfish-Chiangrai
- Floodplain fisheries-Songkhram
- Cage fish culture-along the Mekong, tributaries and reservoirs
Giant catfish at Chiangrai

Spawning area

The 1st successful breeding in 1983
Catch statistic and factor affecting on population decreased

Mekong Giant Catfish Working Group
Impact of Chinese dams on fisheries at Chiangkong

- Unusual variation of water level
- Fish production decrease
- Investigation by scientific approach
- Demonstration of mobile hatchery
Floodplain fisheries

Fisheries-dams related development

Floodplain fisheries at Songkhram River Basin
- estimated prod. 22,000-26,000 tonnes/year for food and income,
- concession fishing by auction system

Pak Mun dam
- decrease in fish production
- close and open sluice gates
- stocking programme
Pak Mun dam sluice gates opened

Giant prawn in Pakse, Champasak
Cage fish culture

Male tilapia cage culture in the Mekong, its tributaries and reservoirs

- culture problems
- massive fish died
- low farm-gate price
Thank you