Reconsidering the Development of the Mekong and its Tributaries
ความมั่นคงทางอาหารและการทวนการพัฒนาแม่น้ำโขงและแม่น้ำสาขา
23 February 2016 @ Ubon Ratchahani University

Impacts of Dam Construction on the Mekong
- The experience of the Mun River -

Yuka Kiguchi
Mekong Watch
• This international river passes through the six countries; China, Myanmar (Burma), Lao PDR, Thailand, Cambodia, and Vietnam.
Fish Diversity in the Mekong Basin

- 781 fish species are found in the Mekong River (2009).
- The Mekong River is the second river in the world for fish diversity (second only to the 1,271 species of the Amazon River).
Rich fish fauna in the mainstream and tributaries

<table>
<thead>
<tr>
<th>Location</th>
<th>Species</th>
<th>Families</th>
<th>Endemic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mekong Mainstream</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China-headwater</td>
<td>24</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>China-upper reach</td>
<td>34</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>China-middle reach</td>
<td>48</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>China-lower reach</td>
<td>122</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>Northern Lao PDR</td>
<td>140</td>
<td>30</td>
<td>26</td>
</tr>
<tr>
<td>Mekong down Khone Falls</td>
<td>168</td>
<td>34</td>
<td>25</td>
</tr>
<tr>
<td>Stung Treng-Khative</td>
<td>204</td>
<td>37</td>
<td>33</td>
</tr>
<tr>
<td>Mekong Delta</td>
<td>486</td>
<td>73</td>
<td>28</td>
</tr>
<tr>
<td><strong>Mekong Tributaries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nam Ou</td>
<td>72</td>
<td>15</td>
<td>29</td>
</tr>
<tr>
<td>Nam Ngum</td>
<td>156</td>
<td>27</td>
<td>43</td>
</tr>
<tr>
<td>Nam Mang</td>
<td>57</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>Nam Kadinng</td>
<td>99</td>
<td>21</td>
<td>38</td>
</tr>
<tr>
<td>Songkharam</td>
<td>216</td>
<td>40</td>
<td>39</td>
</tr>
<tr>
<td>Xe Bang Fai</td>
<td>157</td>
<td>31</td>
<td>51</td>
</tr>
<tr>
<td>Xe Bang Hiang</td>
<td>160</td>
<td>33</td>
<td>47</td>
</tr>
<tr>
<td>Mun/Chi</td>
<td>270</td>
<td>38</td>
<td>49</td>
</tr>
<tr>
<td>Sekong</td>
<td>214</td>
<td>33</td>
<td>63</td>
</tr>
<tr>
<td>Sesan</td>
<td>133</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td>Srepok</td>
<td>204</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td>Thonle Sap Lake</td>
<td>284</td>
<td>45</td>
<td>31</td>
</tr>
</tbody>
</table>

Table: Species Richness in 20 Locations of the Mekong Basin (ICEM 2010: 11)
## Benefits from fish

<table>
<thead>
<tr>
<th>Country</th>
<th>Cambodia</th>
<th>Lao PDR</th>
<th>Thailand</th>
<th>Vietnam</th>
<th>Global Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>49.8</td>
<td>38.31</td>
<td>16.19</td>
<td>12.87</td>
<td>5.78</td>
</tr>
</tbody>
</table>

Table: Animal Protein Consumed per Day 2000-2003 (FAO)

An annual economic value of between USD2.1 - 3.8 billion, and between USD4.2 - 7.6 billion at retail prices (ICEM 2010).
Economic Value of the Mekong River Fisheries

- Around 2.1 million tons per year, equivalent to 18% of the global freshwater fish catch.
- Accounts for between 11.7 - 16% or between 8 - 12% of Cambodia’s GDP.
- Small-scale fishers are not included in the statistics (ICEM 2010).
Fish in the Mekong basin and their migration

Source: MRC
Mun River: Tributary of the Mekong
Rapids and Deep pools
Flood forests and oxbow lakes
Fish Migration from the Lower Mun Basin to the Mekong River

Seasonal fish migration occurs. The fishery provided important resources for villagers’ lives.

Fish Migration
End of Dry Season
Beginning of Dry Season

Dam Construction on the Mun River

- Pak Mun: Hydropower dam funded by World Bank groups; operation started in 1994.
- Obstruction of fish migration route and destructive fishing activity
- Rasi Salai Dam: Operation started in 1993 changing water flow and ecology of flood forests
Lower Mun River

Rasi Salai Dam

Pak Mun Dam

Hua Na Dam
People living along the Mun River
Fish in the daily lives of the people

- Selling to venders
- Self-sufficiency
- Selling by villagers in local market
- Selling in village at low prices
- Exchange for rice
- Gifts to friends and relatives
Local People Protest against the Dam

• 1999: People’s movement calling for opening of both dam's sluice gates.
• 2001: Thai government announced an experimental opening of the gates.
## Income of Villagers per Year (Affected area of Pak Mun Dam)

<table>
<thead>
<tr>
<th>Year</th>
<th>Income from Fishery (Baht)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Dam Construction (1990)</td>
<td>25,742</td>
</tr>
<tr>
<td>2000: Gates closed</td>
<td>3,045</td>
</tr>
<tr>
<td>2001: Gates opened</td>
<td>10,025</td>
</tr>
</tbody>
</table>

Source: Ubon Ratchathani University (2002)
Research during period with dam gates open

Fish change their habitat in each stage of their life history. Development stages of fish are connected to their habitat.
Research: Knowledge of Freshwater Fish Spawning

- The fish carry eggs in the rainy season or in the seventh to eighth lunar months.
- It is reported that at a certain time the fish make a sound and swim in pairs when spawning.
- When spawning, the fish enter hong, water channels that connect the mainstream of the river with the former river course. The fish make a nest at the spawning grounds, in oxbow lakes, at a depth of 2 to 3m or 7 to 8m.
Dams in the Mekong River
Dams in the mainstream Mekong River
Nam Theun 2 Dam, Laos
Can the fishers fish?
Don Sahong Dam
Cambodia

Lao PDR.

Hoo Sahong
Fish Migration through Hoo Sahong

Water level in Pakse (m)

Migration
- Upstream
- Downstream

Other species

Large & medium-sized Cyprinids
esp. Probarbus, Hypsibarbus, Cosmochelius

Small Cyprinids
esp. Henichorhynchus

Medium-sized Cyprinids
multiple species

In red: migrations exclusively through Hoo Sahong

Large Cyprinids
esp. Cirrhinus

Small Pangasiids

Large Pangasiids

Small & medium-sized Cyprinids

World Fish Center 2007
Dams in Lao PDR

- 13 Existing Dams
- 20 Concession Agreements
- 39 Memoranda of Understanding
- 23 Project Development Agreements

(http://www.poweringprogres s.org/new/power-projects)
Lower Sesan 2 dam (LS2)

• LS2 could reduce the basin’s sediment load by 6.0 to 8.0%.
• At least 78,000 villagers living upstream of LS2 will lose access to migratory fish.
• LS2 will cause a 9.3% drop in fish stocks basin-wide.

LS2 is under construction on the Sesan River in Sesan District, Stung Treng Province.
Our Recommendations

• Mainstream dams should be suspended.
• Research on the cumulative impacts of dams in the Mekong River Basin is a crucial requirement that should be carried out before new projects start.
• Mainstream and tributaries should be protected as one ecosystem for sustainable resource management.
• We must learn from the experiences of the dams on the Mun River.

• We need to seriously reconsider the development of the Mekong and its tributaries.
Thank you.