Asian Emporiums – Trade, Culture and Globalization

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PhD (Civil and Environmental Engineering, The University of Edinburgh)

- President, Thai Water Partnership Foundation, GWP (2006-2008)
- Steering Committee Member, Global Water Partnership - Southeast Asia (2006-2008)
- Steering Committee Member, Southeast Asia Water Network (Agua Jaring) (2007-date)
- National Team Leader, CCAI Report 2009, MRC.
- President of University Faculty Senate, and Mahidol University Council Member (2007-2009)
- Advisor & Invited Lecturer, Southeast Asian Studies Program, Thammasat University
- Invited Lecturer, Irrigation College, Kasetsart University
Mekong Feature

• 4,909 km length from Tibet
  – Discharge volume) 475,000 million cubic meter/year
  – Average 15,000 cubic meter per sec (MRC, 2003)

• 10 to 15 % in dry season flows and 85-90 % in wet season

• Mekong Basin Catchment Area: 795,000 km\(^2\), including 70,000 km\(^2\) flooded plains

• Yield of runoff 16 %, 2%, 18%, 35%, 18%, and 11% from China, Myanmar, Thailand, Lao. PDR, Cambodia and Viet Nam (MRC, 2003)
<table>
<thead>
<tr>
<th>Landform</th>
<th>Rainfall (mm/year)</th>
<th>Vegetation</th>
<th>Population Density (person/sq.km.)</th>
<th>Chief Economic Activity</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanchang</td>
<td>Variable 600-2700</td>
<td>Mountain brush, Meadow, pine forest, Mixed evergreen &amp; broad leaved, arable land</td>
<td>Low to moderate: 7-145</td>
<td>Agri. (frequency shifting)</td>
<td>Erosion, forest degradation, Natural disasters</td>
</tr>
<tr>
<td>Northern Highlands</td>
<td>Wet 2000-2800</td>
<td>Grassland Hill evergreen and mountain forest</td>
<td>Low: 8-15</td>
<td>Agri. (frequency shifting)</td>
<td>Erosion, Forest degradation</td>
</tr>
<tr>
<td>Korat &amp; Sakon Plateau</td>
<td>Relatively Dry 1000-1600</td>
<td>Scrub, grassland, arable land</td>
<td>Moderate: 80-160</td>
<td>Agri. (irrigation and rainfed)</td>
<td>Water scarcity, floods and drought, salinization, low fertility</td>
</tr>
<tr>
<td>Eastern Highland</td>
<td>Wet 2000-3200</td>
<td>Upland savannah, rainforest</td>
<td>Low: 6-33</td>
<td>Agri. (shifting)</td>
<td>Erosion, soil degradation, forest degradation</td>
</tr>
<tr>
<td>Lowlands</td>
<td>Variable: 1100-2400</td>
<td>Arable land</td>
<td>Moderate to dense: 10-570</td>
<td>Agri. (rice cultivation)</td>
<td>Flooding, acid-sulfate, soils, salinity intrusion, drought</td>
</tr>
<tr>
<td>Southern Uplands</td>
<td>Relatively wet 1600</td>
<td>Dense forest</td>
<td>Very low: Less than 8</td>
<td>Undeveloped + some shifting agriculture</td>
<td>Vulnerable environment natural reserve</td>
</tr>
</tbody>
</table>
## Country Population (million people)

<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
<th>In LMB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>13.1</td>
<td>9.8</td>
</tr>
<tr>
<td>Lao</td>
<td>5.3</td>
<td>4.9</td>
</tr>
<tr>
<td>Thailand</td>
<td>62.8</td>
<td>23.1</td>
</tr>
</tbody>
</table>

## Areas

<table>
<thead>
<tr>
<th>Country</th>
<th>Areas 1000 km²</th>
<th>% of Basin</th>
<th>% of Basin</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>165</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>Myanmar</td>
<td>24</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Cambodia</td>
<td>155</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>Lao</td>
<td>202</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>Thailand</td>
<td>184</td>
<td>23</td>
<td>18</td>
</tr>
</tbody>
</table>

**Annual discharge**: 475,000 MCM/year or 15,000 cu.m./sec

10-15% flow is in dry season but 85-90% flow is in wet season
Southeast Asia at Mekong River Basin
6 Landforms of Mekong River Basin

6 Landforms concerned:

- Lancang River (Yunnan)
- Northern Highlands (Lao PDR, Myanmar, PRC(Yunnan), Thailand)
- Korat Plateau (Thailand) and Sakon Plateau (Lao PDR)
- Eastern Highlands (Lao PDR, Vietnam)
- Lowlands (Cambodia, Lao PDR, Vietnam)
- Southern Uplands (Cambodia)
Three Rivers Origin: Tibet-Qinghai Plateau
Yangtze, Yellow, and Lancang

- Elevation 4000 m.
- D.A. 320,000 Sq.Km.
- Runoff 25%

Flow to
- 49% flow to Yellow River,
and
-15% to Mekong
Traditional Mekong Sources

• Tibet called “Dza chu” where there are two traditional Mekong sources:
  
The north western source is called Dzanak chu
  
The longest one is the north source is called Dzakar chu
  
(The Chinese Academy of Science, 2006)

• The Book entitled "The last Barbarians" (published by Henry Holt, New York, 1997), Michel Peissel writes about the traditional sources.

Headwater Monument: Source of the river at the foot of Gongdemuzha Mt. by the Scientific Expedition Team of the Chinese Academy of Sciences in July of 1999.
People of Mekong at Traditional Source, Tibet

CHEN Yunfeng, 2005
Mekong at Route to Tibet: Yanjing

CHEN Yunfeng, 2005
Jinshuihe Power Station

CHEN Yunfeng, 2005
Tongle Village, Weixi

CHEN Yunfeng, 2005
1 in 200 Crisis Area of Earth Ecosystems
Biodiversity of The River System

Steep slope

Rapids

Flood Plain

Delta

Mekong

Elevation zones:
- Montane (> 4300m)
- High (> 200m)
- Medium (> 35m)
- Low (< 35m)
• There are over 70 distinct ethnic groups diversity of people in LMB

• Different languages and dialects

• Different cultures and customs
• Different levels of development

• But share some similarities:
  • Most of the population live in rural areas
  • Most are subsistence farmers dependent on wetlands resources for livelihoods

Thanks to MRC, 2005; Anand Kanchanaphan, 2006
• The last few decades have seen an increase in driving forces of changes including development activities (sometimes unsustainable practices), industrialization, urbanization, natural variability, etc.

• In some cases, these have contributed to the reduction of diversity and complexity with a decline in the productivity and services of the wetlands resources.

• This, in turn, has also contributed to poverty and deeper social vulnerabilities.
Human dependence on aquatic resources

Human dependence taken here to refer to the conditions or state of being a community, and its logical relationship with and need for the aquatic resources available to that community with the understanding that the interactions change over time and are not static. MRC, 2005
People in the LMB depend on aquatic resources in many ways. But most commonly quoted include:

- High employment in agriculture including aquaculture

- Very high subsistence-based dependence on fish, plants, etc.

- Important sources for food security

- Importance to GDP, national economies, trade, incomes

- Other employment in river-based activities (transport, trade, tourism, hydropower, etc.)

MRC, 2005
High employment in agriculture

- Overall, 70 percent of a total of 60 million people in the LMB engaged in the agricultural sector depending heavily on aquatic resources

- Much of this is based around subsistence production

MRC, 2005
High employment in capture fisheries

- Capture fish is a significant source of income and employment in the LMB
- 66 percent of the total LMB population are active in fishery
Very high subsistence-based dependence on aquatic resources.

- A broad diversity of aquatic plants and animals are frequently accessed and used by villagers (food, constriction materials, herbal medicines, firewood), eg. in Attapue Province, Lao PDR, this is approaching 200 species

- Poorest people have the highest levels of dependence on aquatic resources

- Proportion of population using fuelwood for cooking
  - Cambodia- around 90 percent in most provinces
  - Laos - 95 percent
  - NE Thailand- 42-83 percent (except for Chantha Buri, 18%)
  - Vietnam MB- 66 percent
Important sources of food security

- The inland capture fisheries together with rice production in the LMB are the basses for the food security of the rural population.
Wetlands in the Mekong

- Wetlands are highly productive
  - 2 million tonnes of fish and other aquatic products
  - 32 million tonnes of rice
  - unknown amount of other products
- Wetlands are highly diverse
- over 800 mammal and 2,800 bird species,
- 1,500 fish species and 250 amphibians,
- 650 reptiles and
- an unknown number of invertebrates
The importance of fish as the main source of protein in people’s diets

- This ranges from 50-75 percent of the total animal protein of human diet in the LMB.

- Average fish consumption in the LMB is not less than 20 kg per capita per year.

- With expected population growth, there will be a need for more fish.

- But captured fishery utilized at its maximum possible level already,
Fish diversity in the Mekong Basin
ca. 1030 species of 91 families (MFD 2002)

- ปลาหนัง (Catfishes) 150 species / 12 family
- ปลากระดูกอ่อน (Elasmobranches) 26 species / 8 family
- ตะเพียน สร้อย (Cyprinids) 255 species
- ปลาหมู รากกล้วย (Loaches) 172 species / 2 family

Thanks to Chavalit Withayanon, 2006
Importance to GDP, national economies

Importance to GDP, the production value of capture fisheries as percentage of GDP:

- 3.9% in Viet Nam,
- 2.04% in Thailand, and
- 1.42% in Lao PDR.
- 10% in Cambodia

The production value of aquaculture as a percentage of GDP is:

- 5.8% in Lao PDR (highest of all Asian countries),
- 3.5% in Viet Nam (2nd highest in Asia),
- 2.07% in Thailand, and
- 0.89% in Cambodia

Sugiyama et al 2004:1
The Changes
Environmental Issues in Sub-region

1. land degradation
2. threats to biodiversity
3. inland water pollution
4. inadequate waste management
5. toxic contamination
6. air pollution by stationary sources
7. mobile source pollution
Environmental Issues in Sub-region

8. threats to coastal zones
9. climate change
10. ozone layer depletion
11. water resources
12. fishery resources
13. forest resources
14. threats to the Mekong’s vital functions
15. illegal trade in wildlife
16. lack of harmonization on policy target and evaluation tools
Several studies released in the past five years suggest that aerosols -- tiny airborne particles of pollution found in smoke from forest fires -- have a "semi-direct" effect on climate, causing a reduction in cloud cover and warming the land surface.

According to a release from NASA's Tropical Rainfall Measuring Mission, "processes that often create rain in tropical clouds are practically shut off when the clouds are polluted with heavy smoke from forest fires.

" The paper's author, Dr. Daniel Rosenfeld comments "We've seen evidence of decreased precipitation in clouds contaminated by smoke, but it wasn't until now that we had direct evidence showing that smoke actually suppresses precipitation completely from certain clouds.

Source: Nipon Tangtham, 2007

Fires and smoke in Myanmar, Thailand, Laos, and Vietnam

Research carried out by the National Aeronautics and Space Administration (NASA) has recently proven that smoke from biomass burning inhibits rainfall (Steitz et al. 1999).

Measurements from NASA’s TRMM (Tropical Rainfall Measuring Mission) indicate that in clouds polluted with smoke from forest fires the warm rain processes in the clouds are practically shut off (Steitz et al. 1999).

Source: Nipon Tangtham, 2007
Non-ecosystem based management!
Poor ecosystem.....and land use
Sedimentation in a sub-watershed of Mekong, Thailand
Interregional Economic Cooperation

Afganistan
Pakistan

India

Bangladesh

China

Myanmar
Laos

Vietnam
Cambodia

ACMECS

BIMSTEC

GMS

Thailand

IMT-GT

Thanks to Damrong Saengkaveelert
High Potential Routes

Thanks to Damrong Saengkaveelert
Agreement on Transportation within GMS

- Thai, Laos, and Vietnam signed the Agreement on 26 November 1999, at Vientiane
- Cambodia signed in the Agreement by Ministerial Level at 10th GMS Meeting on 29 November 2001 at Rangoon
- China has been added during GMS Summit on November 2002 at Cambodia
- Myanmar also added in the Agreement by Ministerial Level at 12th GMS Meeting at Dali, Yunnan

Thanks to Damrong Saengkaveelert
Thanks to Damrong Saengkaveelert
Thailand
Lao PDR
Cambodia
Vietnam
Myanmar

Ayeyawady-Chao Praya-Mekong Economic Cooperation Strategy “ACMECS”

Thanks to Damrong Saengkaveelert
1. Transportation Link between Thai-Myanmar (Mae Sod – Myawaddy - Thaton)

Thanks to Damrong Saengkaveelert

Thailand

Myanmar

Thai will support the transportation link between Mae Sod - Myawaddy - Thaton, with a distance of 200 km. By 2547, the total distance is 18 km. It will be financed from the Thai government for 122.9 billion baht, with the remaining 182 km to be financed under concessional terms.

Mae Sod

Bago

Yangon

Payagyi

Mawlamyine

Thonbyuzayat

Immigration

Kawkareik

Eindu

Pa-an

Thaton

Myawaddy

Mae Sod

Thanks to Damrong Saengkaveelert
2. Transportation Link between Thai - Laos

Thanks to Damrong Saengkaveelert
ไทยให้ความช่วยเหลือเป็นเงินให้เปล่า 126 ล้าน กำหนดสำรวจออกแบบ และก่อสร้างให้แล้วเสร็จภายในปี 2547

ไทยให้ความช่วยเหลือเงินกู้เงื่อนไขผ่อนปรน 856 ล้าน สร้างสะพานและปรับปรุงถนน ก้าหนดก่อสร้างปี 2547-2549

3. Immigration and Transportation Link (Thai-Cambodia)

Thanks to Damrong Saengkaveelert
Human Trafficking

• trafficking in persons
• people’s smuggling
• faults information / partial information
• sending country / receiving country / transit center
• broker, trafficker, smuggler

Source: Kritaya Archavanitkul, 2549
Figure 7. Electricity consumption per capita (kWh), 1997-2000

Sources: EEPSEA 2002; Ministry of Planning 1998b; NIS 1998; NSC 2001; NSC/UNDP 2002;
Table 1. Population of the Lower Mekong Basin (LMB)

<table>
<thead>
<tr>
<th></th>
<th>Population LMB (est.)</th>
<th>% LMB Population</th>
<th>% National Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>9,800,000</td>
<td>17.9</td>
<td>80.4</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>4,905,000</td>
<td>17.9</td>
<td>93.9</td>
</tr>
<tr>
<td>Thailand</td>
<td>23,130,000</td>
<td>42.2</td>
<td>37.5</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>16,920,000</td>
<td>30.9</td>
<td>21.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>54,755,000</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* The data for Cambodia are based on the 1998 Census. The data for other countries are for 2000, based on preliminary census results (Thailand) or government estimates. However, the data for Thailand count people based on registered residence. In the case of the Northeast, a large proportion of the registered population may actually be living outside the region, e.g., in Bangkok.

*Sources:* NIS 1998; NSC/UNDP 2002; NSO 2002a; UNDP-Viet Nam 2002
Possible Dam Sites

http://www.searin.org/Th/SWD/SWDmap.htm
### Dam projects in a Mekong Sub-basin (Chi), Thailand

<table>
<thead>
<tr>
<th>No</th>
<th>Reservoir</th>
<th>capacity (MCM)</th>
<th>Height (m)</th>
<th>Power Generation (KW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min. Capacity</td>
<td>Retention Level</td>
<td>Max. Capacity</td>
</tr>
<tr>
<td>1</td>
<td>Som Poi</td>
<td>0.60</td>
<td>7.55</td>
<td>8.53</td>
</tr>
<tr>
<td>2</td>
<td>Thong Lang</td>
<td>0.01</td>
<td>0.29</td>
<td>0.35</td>
</tr>
<tr>
<td>3</td>
<td>Ba Zan</td>
<td>0.08</td>
<td>0.35</td>
<td>0.46</td>
</tr>
<tr>
<td>4</td>
<td>Cho Raka</td>
<td>0.80</td>
<td>10.31</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Hin Lab Meed</td>
<td>0.11</td>
<td>0.48</td>
<td>6.5</td>
</tr>
<tr>
<td>6</td>
<td>Ban Petch</td>
<td>3.00</td>
<td>19.66</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td>Nam Prom</td>
<td>0.80</td>
<td>3.5</td>
<td>4.2</td>
</tr>
<tr>
<td>8</td>
<td>Huai Sai</td>
<td>1.50</td>
<td>10.4</td>
<td>14.74</td>
</tr>
<tr>
<td>9</td>
<td>Lam Khan Chu</td>
<td>3.30</td>
<td>42.5</td>
<td>56</td>
</tr>
<tr>
<td>10</td>
<td>Chi Bon</td>
<td></td>
<td>325</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Yang Na Dee</td>
<td></td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Prong Khun Petch</td>
<td></td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Lam Sa Pung</td>
<td></td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Preliminarily study on water network in Chaiyapum province, Chaiyapum Irrigation Project, Regional Irrigation Office 6, Royal Irrigation Department, 2004
Planed Dam Sites in LMB
ปัญหาสุดที่เชื่อมโยงกับเศรษฐกิจแบบทุน
## Mainstream Dams

<table>
<thead>
<tr>
<th>Project</th>
<th>Likely market</th>
<th>Project Sponsors</th>
<th>Notes/remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pak Beng</td>
<td>Thai</td>
<td>Datang International</td>
<td>MoU – Aug 2007</td>
</tr>
<tr>
<td>1,230</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xayabouri</td>
<td>Thai</td>
<td>Ch. Karnchang</td>
<td>MoU - 4 May 2007; study completion - 30 mths; construction by 2011 and operational by 2015; estimated cost – US$1.7 billion</td>
</tr>
<tr>
<td>1,260</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pak Lay</td>
<td>Thai</td>
<td>Sinohydro and (CNEIC)</td>
<td>MoU - 11 June 2007; estimated cost – US$ 1.7 billion</td>
</tr>
<tr>
<td>1,320</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don Sahong</td>
<td>Thai or Camb</td>
<td>Mega First Corporation Berhad (MFCB)</td>
<td>Mou – March 2006; draft final EIA submitted to GoL; EIA conducted by (APW); estimated cost – US$300 million</td>
</tr>
<tr>
<td>240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sambor</td>
<td>VN or Thai</td>
<td>China Southern Power Grid (CSGP)</td>
<td>MoU - 31 October 2006; study being undertaken by CSGP’s subsidiary, Guangxi Grid Company</td>
</tr>
<tr>
<td>3,300 or 465</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• All proposed projects for export
• 4 of 5 proposed mainstream dams in Lao PDR (hydro-boom); 40-50 projects at various stages of planning
• Thai-Laos
• Chinese investment
Potential Impacts of Proposed Mekong Mainstream Dams

An Overview
Displacement

- Pak Lai: 1,720 people
- Xiayaburi: 11,780 people
- Don Sahong: 14 families
- Sambor: 5,120 people (with 3,300 MW scheme)
Fisheries and Local Economy

• Blocking fish migratory route
• Destroying fish habitats, spawning grounds
Fisheries and local livelihoods
Fish ladder doesn’t work
Consequences of Flow Change

Development in river basins can lead to changes in river flows:

- vegetation change
- river regulation
- water extraction

Thanks to Ian Campbell, Environment Programme
Change in Sedimentation After Manwan Dam (1993)

TSS at Chaeng Saen (1985-1992)
Water Level after Manwan Dam

January

April
Simulated Flow after Dams

Xiowen + Nuozhadu - Kratie

1996
-8%
+26%

1997
-3%
+34%

1998
-9%
+42%

WILDLIFE TRADE IN SOUTHEAST ASIA

Kampanad Bhaktikul PhD
WHAT IS WILDLIFE TRADE ???

The world's wildlife resources are important to all people, providing us with food, medicines, clothing and other products.
WHAT IS WILDLIFE TRADE ???

Many of the natural products used in the developed world are actually derived from animals and plants in the wild - whether it is fish or caviar served in a restaurant, drugs derived from medicinal plants or furniture made from timber extracted from the rainforest.
Live exotic animals are popular companions and kept for display, while live plants from the wild adorn homes and gardens around the world.

Wildlife is especially important to people in the developing world, providing them with an accessible source of food, affordable medicines as well as vital resources upon which livelihoods are dependent.
WILDLIFE IN SOUTHEAST ASIA

Deer, Borneo, Malaysia
(Takeshi Mizukoshi Wildlife Beauty Collection.)

Snake, Borneo, Indonesia. (Takeshi Mizukoshi Wildlife Beauty Collection)
WILDLIFE IN SOUTHEAST ASIA

Bird in rain forest. Irian Jaya. Indonesia.

Orangutan, Borneo, Indonesia.
WILDLIFE IN SOUTHEAST ASIA

Four-lined Tree Frog, Endau-Rompin National Park, Malaysia

Blue-eared Kingfisher, Kinabatangan River, Sabah, Borneo.
Probably the most successful primate species in Southeast Asia (besides Homo sapiens), the Long-tailed Macaque is to be found in a wide range of habitats including primary and secondary forest, mangroves, plantations and the outskirts of towns and villages.

Photographed at Bukit Timah Nature Reserve, Singapore.

Macaque (มะaca) = หรือ ติ่งทางสัน หรือติ่งก้ำง
The species ranges from Indochina, Southern Thailand and Peninsular Malaysia to Sumatra, Java, Borneo and the Philippines.

In Singapore it is the commonest primate.
Earless Agamid

This species is to be found mainly in primary forest.

Its spindly body shape and lack of external ear opening are the keys to its identification.

Its body scales are extremely small, its neck crest is generally not visible and the inside of the mouth is light blue.

Female photographed at Sime Forest, Singapore

Lizard in the family Agamidae, containing about 300 species.
The iris (ม่านตา) of the female and juveniles is brown, however in some populations the iris of the male may be a stunning blue.

This charming species appears to be active both by day and night.

It ranges from southern Thailand through Peninsular Malaysia to Singapore.

It also occurs on the island of Borneo.
The Asian Elephant, so long a central part of many Southeast Asian cultures, is in slow decline. Once used for timber extraction and other duties its place has been taken by tractors and bulldozers.

In Thailand there are efforts to find new jobs for working elephants in the eco-tourism industry, and to carry forest rangers in protected forests.
Southeast Asia has approximately 88 species of freshwater turtles and tortoises, more than any other region in the world.

All of these species are found in the trade, mostly for meat consumption but also for the pet trade.

(turtle = sea creature like a tortoise, tortoise = slow moving reptile with a hard shell)
This group of reptiles represents one of the highest volumes of Asian wildlife in observable trade over the past decade.
For many foreigners, the location "Southeast Asia" typically evokes visions of rainforests, a rich and diverse cultural history, and people renowned for their charm and hospitality - rather than an import-export emporium for trade in wild plants and animals.
Southeast Asia's rich biodiversity, ranging from charismatic megafauna such as tigers and elephants, to rare orchids and far-ranging marine turtles, is ironically the very reason why these species are well known far beyond their natural habitats in the international markets of East Asia, Europe and North America.
• Indeed, Southeast Asia has supplied a significant portion of the global trade in wildlife for centuries.
• A complex chain of supply, partnered with diversifying consumer demand, makes effective conservation and management of wild species in the region extremely challenging.
Consumption patterns regularly change with market movements.

Wildlife in Southeast Asia
the consistent demand for some species favoured in the exotic pet industry (e.g. reptiles and birds),

as part of traditional medicine practices (e.g. pangolin scales and freshwater turtle shells),
Wildlife in Southeast Asia

- as ornamental decorations (e.g. horns, antlers and skins),
- in private zoo collections (e.g. primates)

antler = เขากวาง, primates = จำพวกกลิง
Wildlife in Southeast Asia

• and as ‘tonic food’ items (e.g. pangolins, freshwater turtles, snakes) is now so high that many species’ survival is in peril.

(peril = risk)
Hunting and trade occur throughout pangolins' range - in Southeast Asia, pangolins are found in all countries from Myanmar through to Indonesia, and on the island of Palawan in the Philippines - and are driven by a high demand for nearly all body parts.
Loaded and Packed from Thai to Iran, 2010

Source: Thairath
• Increasing efforts to stop the illegal wildlife trade and reflects Thailand's commitment as the lead country in the ASEAN-Wildlife Enforcement Network (ASEAN-WEN).
Critical Endangered

Thanks to Chavalit Withayanon, 2006
Illegal fishing

Fishing gillnet

Pollution
Mekong Giant Catfish

- Recent catch in northern Thailand – officially the largest FW fish in the world.
- Maximum length: 300 cm and weight up to 300kg

- **Challenges & threats:**
  - Fishing pressure
  - Obstructions in migratory pathways
  - Spawning grounds under pressure

Critically Endangered (CR)

![Graph showing Catch Per Unit Effort for Mekong Giant Catfish from 1986 to 1997]
Giant Catfish - Post Capture Mortality

Source: Mekong Post, 2006
Giant Catfish Capture Record 1986-2005

Source: Mekong Post, 2006
We May Know the Price, But What is The Value?

Alvin Lopez, 2005
Giant Catfish - Post Capture Mortality

- Damage possibly done before the tagging team gets the fish.
Other factors contributing to post capture mortality

- The length of time the fish is in the dai,
- Handling of the fish from the dai and method that it is held
- Handling during tagging, measurement, and photography
- Disease/infection post-release.
Flagship spp - Siamese Crocodile

Challenges and threats in the region:

- Habitat loss
- Accidental captures with fishing equipment
- Weak enforcement and uncontrolled trade
- Intentional hybridisation in farms.
- Lack of crocodile management skills and experience

Regional SCAP development

- Overview and findings of the Siamese Crocodile field activities in Lao PDR and Vietnam
Sarus Crane

• The tallest flying bird (6 feet) and wing span of 8 feet.
• Three subspecies globally.
• In the LMB - The Eastern Sarus Crane (*G. antigone sharpii*), of which 800-1000 individuals remain.
• Habitat – seasonal marshes and open Dipterocarp forest, and floodplains.
• Nests during the rainy season in shallow water with short emergent vegetation.
Irrawaddy Dolphin

Facts:
• About 70 individuals remaining
• In nine deep pools between Kratie (Cambodia) and Khone Falls (Laos)

Challenges & threats:
• Gillnets
• Destructive fishing practices
• Collisions with tourist boats
• Toxic effects from mercury?

MWBP focus:
• Support the implementation of the Dolphin Conservation Strategy
• Facilitate and participate in trans-boundary dialogue
Climate Change and Future Management

- the earth, climate system and
- explores the science and politics of global climate change.
- the greenhouse effect, trend of climate change, El Niño, ocean circulation, Kyoto Protocol, deforestation of the tropical rainforest within the region, impacts on various situations
- and future management and researches
change in wet year annual discharge

after Anond Snidvongs, 2007
<table>
<thead>
<tr>
<th>Station</th>
<th>Mean Annual Flow (m³/s)</th>
<th>Flow Change (%) compared to 1985-2000</th>
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<tr>
<td>Upper Mekong</td>
<td>2,162</td>
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<td>Kratie</td>
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<td>13,193</td>
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Vithet Srinetr et al., 2009
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<td></td>
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<td>120.0</td>
</tr>
</tbody>
</table>

Vithet Srineetr et al., 2009
Impact on Energy Sector in Viet Nam


Temp. Data Source: CGIAR 2006

Key to Features
Hydropower plants (Status)
- Existing / constr.
- Planned
Thermal power plants (Status)
- Existing
- Planned
Risk Area
- 1m slr + 3m storm surge
- 5m slr + 3m storm surge
Change in TempMEAN
- Increase
- Stable
- Decrease

Key to Features
Hydropower plants (Status)
- Existing / constr.
- Planned
Change in TempMAX (°C)
- < 0.25
- 0.25 - 0.5
- > 0.5
Change in TempMEAN (°C)
- < 0.25
- 0.25 - 0.5
- > 0.5
Increased
Stable
Decreased
Climate Change and Storm Surge Effect in Cambodia

Cambodia's tourism sector is developing fast into one of the major sources of income in the country, providing many people with sustainable incomes. Successful growth however will depend on how well Cambodia can protect its tourism assets and provide tourist safety from risks associated to climate change.

By 2100, IPCC scenarios indicate a sea level rise above 0.5m which will be accelerated if present rate of ice melt from Greenland and Antarctica increases. Beyond 2100, sea level will rise up to 7m if complete elimination of Greenland ice sheet occurs.
By 2100, IPCC scenarios indicate a sea level rise above 0.2m which will be accelerated if present rate of ice melt from Greenland and Antarctica increases. Beyond 2100, sea level will rise up to 7m if complete elimination of Greenland ice sheet occurs.

Key to Features
Population (#/sq.km)
- 0
- 1 - 5
- 6 - 25
- 26 - 50
- 51 - 100
- 101 - 500
- 501 - 2,500
- 2501 - 5,000
- 5001 - 130,000

Boundaries
- International Boundary
- National Boundary

Impacts of climate change at Mekong Delta

- Drought
- Flood
- Fire forest
- Bank Erosion

Nguyen Xuan Hien, 2009
- Impacts Area 1.4 - 1.6 Million Ha
- Salinity (4 g/L): 40 - 50 km.
- Duration 1 - 3 months

Nguyen Xuan Hien, 2009
- Area loss 1.2 - 1.9 million Ha
- Flood level 0.5 - 4.0 m.
- 3 - 5 months
Mekong Environmental Programs
Environment Programme

A. Environmental Monitoring and Assessment
B. Environmental Decision Support
C. People and Aquatic Ecosystems
D. Environmental Knowledge
E. Environmental Flow Management
A – Environmental Monitoring and Assessment

Water Quality Monitoring

Ecological Health monitoring

Social impact monitoring
Regulation on Water Use

1. Procedures for Data and Information Exchange and Sharing
2. Preliminary Procedures for Notification, Prior Consultation and Agreement
3. Procedures for Notification, Prior Consultation and Agreement
4. Procedures for Water Use Monitoring
5. Procedures for Maintenance of Flows on the Mainstream
6. Procedures for Water Quality

Thanks to Pakawan Chufahmanee
Flood Mitigation and Management Strategy
Species Conservation Action Plans for Biodiversity Conservation in the Lower Mekong Basin
MWBP Flagship species

*Siamese Crocodile*

*Mekong Giant Catfish*

*Sarus Crane*

*Irrawaddy Dolphin*
Triangles – 2005 survey sites.

Circles – provincial towns.
(1) Crocodile records in Lao PDR and the national protected areas system;

(2) Minimum area of *C. siamensis* distribution encompassed by records, wetlands of high conservation priority. (Numbers 1-4 are locations of four nest sites reported in 2005)
Croc surveys in Viet Nam 2005

- Surveys in Viet Nam conducted in collaboration with FFI and ITB
- Rediscovery of wild Siamese Crocs in Viet Nam.
Sarus Crane

• The tallest flying bird (6 feet) and wing span of 8 feet.
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• Habitat – seasonal marshes and open Dipterocarp forest, and floodplains.
• Nests during the rainy season in shallow water with short emergent vegetation
Ecological health monitoring program

Source: Bruce Chessman
WETLAND MAP OF LAO PDR

Legend

- River
- Unit B boundary
- Country boundary

Wetland Classes

- Unidentified/Class not exist
- Riverine - Perennial - Natural channel
- Riverine - Perennial - Waterfall
- Barl/Beach/Bar
- Floodplain - Wet grassland and marsh
- Floodplain - Rice
- Floodplain - Introduced scruber, e.g., Mimomosa
- Floodplain - Other crops
- Floodplain - Backswamp - seasonal marsh/swamp
- Perennial Palustrine - Wet grassland - pasture/marsh
- Perennial Palustrine - Swamp - minerotrophic; woody shrub and tree sp.; increased water level
- Seasonal Palustrine - Marsh - minerotrophic; emergent sp.; sedge/rush/shrub sp.; increased water level
- Seasonal Palustrine - Artificially flooded seasonally wet grassland - minerotrophic; emergent sp.
- Lacustrine - Perennial natural Lake
- Lacustrine - Reservoir - drinking/migration/hydropower

Sources: Old wetland data of Lao PDR. The coverage is buffer of 50km of the Mekong Corridors.

Remarks: Classes shown here are based on the simplified MRC wetland classification.

Disclaimer: While every care is taken to ensure the accuracy of the data used in this map, the Mekong River Commission and the Governments of the Kingdom of Cambodia, the Lao People’s Democratic Republic, the Kingdom of Thailand and the Socialist Republic of Vietnam make no representation or warranty about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages, costs or claims which may be incurred as a result of the data being inaccurate or incomplete in any way and/or any reason.

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Survey Date: 9/15/2004
Surveyor: Charlotte
Season: Wet
Site Name: Stung Treng
Waypoint No: 20
Easting: 605267
Northing: 1532771

Original Image Name: ST_wet_C15-9-4_21
Image Name: SWAMP_Stung Treng_15-9-04_21.jpg
Survey Notes: More dense near shore - extends across channel to east but very sparse
Supervised classification of LANDSAT image (2 dates 31/12/00 & 12/5/02) of Stung Treng wetland site using dry season 2004 habitat data.
Trans-boundary sub-catchment of the Lower Mekong Basin
Stung Treng - Siphandon wetlands

• An ecologically and economically important area,
• A stretch of the MR characterized by strong turbulent flow with numerous channels between rocky and sandy island that are completely inundated during high water, high alluvial islands that remain dry,
Stung Treng-Siphandon wetlands

• Contains a unique habitat, deep pools for (freshwater) animals and fish at critical stage,
• The major feature of the ST-SD is the presence of a unique type of open forest growing on the sandy islands within the MR channel,
• Stung Treng as Ramsar site, No 999, 1999
• Siphandon – potential as a Ramsar site.
THE ASEN Declaration
(Bangkok Declaration)
BANGKOK, 8 AUGUST 1967

The Prime Minister of Malaysia, the Deputy Prime Minister of Thailand, the Secretary-General of the Philippines, the Minister for Foreign Affairs of Singapore, and the Minister of Foreign Affairs of Thailand,

MINDFUL of the existence of mutual interests and common problems among the countries of South-East Asia and conscious of the need to strengthen further the existing bonds of national solidarity and cooperation;

DESIRED to establish a firm foundation for common action to promote regional cooperation in South-East Asia in the spirit of equality and partnership and thereby contribute towards peace, progress and prosperity in the region;

CONSIDERING that in an interdependent world, the cherished ideals of peace, freedom, social justice and economic well-being are best achieved by fostering good understanding, good co-operation and meaningful co-operation among the countries of the region already based upon a rich history and culture;

CONSIDERING that the countries of South-East Asia shall bear responsibility for strengthening the economic and social stability of the region and ensuring its peaceful and progressive national development, and that they are determined to ensure their stability and security from external incursions, by their own means and means of their people;

AFFIRMING that all foreign aid is temporary and remains only with the expressed concurrence of the countries concerned and are not intended to be used directly or indirectly to subvert the national independence and interests of the states in the area or to prejudice the orderly process of their national development;

DO HEREBY DECLARE,

FIRST, the establishment of an Association for Regional Cooperation among the countries of South-East Asia to be known as the Association of South-East Asian Nations (ASEAN);

SECOND, that the aims and purposes of the Association shall be:

1. To accelerate the economic growth, social progress and cultural development in the region through joint efforts and in harmony with the aims and purposes of the United Nations Charter;

2. To promote national peace and security through active cooperation amongst the states and the maintenance of friendly relations among the peoples of the region;

3. To ensure a steady improvement in the standard of living of the common people of South-East Asia;

4. To work for the removal or reduction of barriers to the free flow of capital, technology and professional skill among the states of the region;

5. To collaborate more effectively for the greater advantage of the peoples and the economies of their countries, including the study of the problems of international commodity prices, the improvement of transportation and communications facilities and the raising of the living standards of their peoples;

THIRD, that to carry out these aims and purposes, the following machinery shall be established:

1. An Annual Meeting of Foreign Ministers, which shall be by rotation and, in the absence of either, the President of the Association shall invite the Foreign Ministers to participate;

2. An Economic Committee, charged with the responsibilities of the Finance Ministers of the Association as the body of the Association to consider the economic and social development of the region including the study of the problems of international commodity prices, the improvement of transportation and communications facilities and the raising of the living standards of their peoples;

4. A Consultative Committee, charged with the responsibilities of the Foreign Ministers to consider the political and security aspects of regional cooperation;

5. To promote South-East Asian mutual assistance;

6. To maintain close and beneficial cooperation with existing international and regional organizations with similar aims and purposes, and explore all means for such cooperation among themselves;

DONE in Bangkok on the Eighth Day of August in the Year One Thousand Nine Hundred and Fifty-Seven.

FOR THE REPUBLIC OF MALAYSIA,

ADAM MALIK
Prime Minister

FOR THE REPUBLIC OF THAILAND,

NARASINGA RAMA
Secretary for Foreign Affairs

FOR THE REPUBLIC OF PHILIPPINES,

S. RAJABATANAM
Minister for Foreign Affairs

FOR THE REPUBLIC OF SINGAPORE,

FOR MALAYSIA,

NARASINGA RAMA
Secretary for Foreign Affairs

FOR THE KINGDOM OF THAILAND,

NARASINGA RAMA
Secretary for Foreign Affairs

FOR THE PHILIPPINES,

S. RAJABATANAM
Minister for Foreign Affairs

THANAT KHOMAN
Minister for Foreign Affairs
Beyond ASEAN Integration: Where is ASEAN now?

EU Process

1. FREE TRADE AREA
2. CUSTOMS UNION
3. COMMON MARKET
4. ECONOMIC UNION
5. POLITICAL UNION

“USA”

EUROPEAN UNION

EUROPEAN COMMUNITY

ANDEAN, MERCOSUR, NAFTA

EUROPEAN FREE TRADE ASSOCIATION, NAFTA, ASEAN

EU & Regional Integration by Josephine & Go, Geumju (1 Dec 08)
• ASEAN Free Trade Area : AFTA
• Asia Bond: Regional Bond Market
• Asia-Pacific Economic Cooperation
References

References

- [http://www.probeinternational.org/pi/Mekong/index.cfm](http://www.probeinternational.org/pi/Mekong/index.cfm)
Acknowledgement

• ชาญวิทย์ เกษตรศิริ, เตือนใจ ดีเทศน์, สนิท ทองสง่า, ผกาวรวรรณ จุฑาภรณ์, มานี, ธนาศ อากะรนสุวรรณ, ด้ารง แสงกวีเลิศ, นิพนธ์ ตั้งธรรม
• Bruce Chessman: Ecological Health Monitoring Program
• Charlotte Mac Alister: Wetland Classification and Mapping in the Lower Mekong Basin (EP activity C0006)
• Jackie King: Environmental flows in the Lower Mekong Basin
• Meng Monyrak: Trans-boundary Wetland Management at Stung Treng and Siphandon
• Alvin Lopez: Species Conservation Action Plans for Biodiversity Conservation in the Lower Mekong Basin
• WILD-AID