“Shrimp farming in Vietnam: at the crossroads of Sustainability ? ”

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Vietnamese Shrimp Farming (SF) development takes place in the common history of the agitated SF development over the Asian littorals. Common trends but also differences are noted and lessons can be learnt for the sustainable development of the industry.

- the World context

-SF in Vietnam
  - Development History
  - Challenges

-Sustainability Issues

-Conclusion / Discussion
World Shrimp Farming (1,000 MT – Globefish FISHDAB 2006)
World Shrimp Production 1979 - 2005 (million MT)

(Globefish, 2006)
World Shrimp Farming (1,000 MT – Globefish FISHDAB 2006)
Estimates of Shrimp Aquaculture Production per country 1975 - 2005 (1,000 MT - Globefish)

The World context

Production 1,000 MT

China; 750
Thailand; 418
Indonesia; 300
India
Viet Nam; 300
Bangladesh
Ecuador
Philippines
Taiwan PC

The chart shows the production of shrimp aquaculture per country from 1975 to 2005, with China being the leading producer. The production values are given in thousands of metric tons. The data is sourced from Globefish.
### Shrimps exportations (head-less) - unit: tons.

<table>
<thead>
<tr>
<th>Province</th>
<th>1992</th>
<th>1995</th>
<th>% 94/95</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAKARTA</td>
<td>11 705</td>
<td>10 947</td>
<td>-19%</td>
</tr>
<tr>
<td>MEDAN</td>
<td>14 193</td>
<td>12 114</td>
<td>-15%</td>
</tr>
<tr>
<td>SURABAYA</td>
<td>25 992</td>
<td>18 164</td>
<td>-1%</td>
</tr>
<tr>
<td>BANDAR LAMPUNG</td>
<td>2 807</td>
<td>10 194</td>
<td>22%</td>
</tr>
<tr>
<td>Sub Total</td>
<td>54 697</td>
<td>51 419</td>
<td>-6%</td>
</tr>
<tr>
<td>Others</td>
<td>45 758</td>
<td>58 651</td>
<td>30%</td>
</tr>
<tr>
<td>Total INDONESIA</td>
<td>100 455</td>
<td>110 070</td>
<td>11%</td>
</tr>
</tbody>
</table>

Fisheries Statistics of Indonesia ; Jakarta March 1996

- A chaotic development linked to a risky business: appearance of diseases, technical problems and environmental degradations, poor management of natural resources, social disruption.
- All of them are closely interrelated.
- This well known “boom and burst” development acts as a “natural” regulator and allows to:
  - maintain a high level of price facing a growing demand for tropical peneid shrimps
  - strengthen the “pink gold rush” and the gambling or logic lottery
**the World context**

Examples of direct economic losses due to White Spot Virus (WSSV)

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1993</td>
<td>1 000 000 000 USD</td>
</tr>
<tr>
<td></td>
<td>1994</td>
<td>400 000 000 USD</td>
</tr>
<tr>
<td>Thailand</td>
<td>1996</td>
<td>500 000 000 USD</td>
</tr>
<tr>
<td>Ecuador</td>
<td>1999</td>
<td>150 000 jobs lost</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>580 000 000 USD</td>
</tr>
</tbody>
</table>
Vietnam presents similar trends in the beginning of its shrimp industry development.

SF is strongly located in the Mekong Delta, enjoying large areas and better climatic conditions, under an important diversity of production systems.

<table>
<thead>
<tr>
<th>Area</th>
<th>Tông số</th>
<th>Nuôi cá</th>
<th>Nuôi tôm</th>
<th>Nuôi thủy sản khác</th>
<th>Sản xuất giống</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Fish culture</td>
<td>Shrimp culture</td>
<td>Culture of other species</td>
<td>Seed producing</td>
</tr>
<tr>
<td>Đồng bằng sông Hồng - Red River Delta</td>
<td>81 149,0</td>
<td>59 263,0</td>
<td>15 171,0</td>
<td>5 739,0</td>
<td>976,0</td>
</tr>
<tr>
<td></td>
<td>9,4%</td>
<td>22,9%</td>
<td>2,6%</td>
<td>22,5%</td>
<td>36,8%</td>
</tr>
<tr>
<td>Đồng Bắc - North East</td>
<td>40 967,0</td>
<td>27 485,5</td>
<td>10 811,0</td>
<td>2 362,0</td>
<td>308,5</td>
</tr>
<tr>
<td></td>
<td>4,7%</td>
<td>10,6%</td>
<td>1,9%</td>
<td>9,3%</td>
<td>11,6%</td>
</tr>
<tr>
<td>Tây Bắc - North West</td>
<td>4 687,0</td>
<td>4 647,0</td>
<td>1,0</td>
<td>-</td>
<td>39,0</td>
</tr>
<tr>
<td></td>
<td>0,5%</td>
<td>1,8%</td>
<td>0,0%</td>
<td></td>
<td>1,5%</td>
</tr>
<tr>
<td>Bắc Trung Bộ - North Central Coast</td>
<td>39 806,0</td>
<td>25 480,0</td>
<td>12 081,0</td>
<td>2 024,0</td>
<td>221,0</td>
</tr>
<tr>
<td></td>
<td>4,6%</td>
<td>9,8%</td>
<td>2,1%</td>
<td>7,9%</td>
<td>8,3%</td>
</tr>
<tr>
<td>Duyên Hải Nam Trung Bộ - South Central Coast</td>
<td>21 566,0</td>
<td>7 438,4</td>
<td>13 477,6</td>
<td>570,0</td>
<td>80,0</td>
</tr>
<tr>
<td></td>
<td>2,5%</td>
<td>2,9%</td>
<td>2,3%</td>
<td>2,2%</td>
<td>3,0%</td>
</tr>
<tr>
<td>Tây Nguyên - Central highlands</td>
<td>6 175,0</td>
<td>6 117,4</td>
<td>3,0</td>
<td>-</td>
<td>54,6</td>
</tr>
<tr>
<td></td>
<td>0,7%</td>
<td>2,4%</td>
<td>0,0%</td>
<td></td>
<td>2,1%</td>
</tr>
<tr>
<td>Đồng Nam Bộ - South East</td>
<td>52 083,0</td>
<td>36 027,0</td>
<td>10 363,0</td>
<td>5 448,0</td>
<td>245,0</td>
</tr>
<tr>
<td></td>
<td>6,0%</td>
<td>13,9%</td>
<td>1,8%</td>
<td>21,4%</td>
<td>9,2%</td>
</tr>
<tr>
<td>Đồng bằng sông Cửu Long - Mekong River Delta</td>
<td>621 180,0</td>
<td>92 531,0</td>
<td>518 557,0</td>
<td>9 362,0</td>
<td>730,0</td>
</tr>
<tr>
<td></td>
<td>71,6%</td>
<td>35,7%</td>
<td>89,3%</td>
<td>36,7%</td>
<td>27,5%</td>
</tr>
<tr>
<td>CÂU NƯỚC - WHOLE COUNTRY</td>
<td>867 613,0</td>
<td>258 989,3</td>
<td>580 464,6</td>
<td>25 505,0</td>
<td>2 654,1</td>
</tr>
</tbody>
</table>
SF is strongly located in Southern provinces
Mixed Mangrove - Shrimp

Shrimps from polyculture systems

Rice – Shrimp (rotation)

Intensive system
Resolution 09/NQ-CP in 2000
Allow to transform coastal saline rice fields into shrimp farms

1985
- Doi Moi
- Economic reform
- Adoption of a market socialism program

1995
- Yield Kg/ha: 224 kg/ha
- Area ha: 251,334 ha
- Production Kg: 56,344 tons

2000
- Yield Kg/ha: 400 kg/ha
- Area ha: 258,000 ha
- Production Kg: 103,000 tons

2001
- Yield Kg/ha: 340 kg/ha
- Area ha: 478,800 ha
- Production Kg: 162,713 tons

2002
- Yield Kg/ha: 340 kg/ha
- Area ha: 530,000 ha
- Production Kg: 180,000 tons

- Land status changes
- Lack of knowledge
- Lack of capital and access to capital
- Lack of extension
- Diseases
- Environmental degradations

- Gvt. Support
- Foreign currencies
- External investors

- Technical improvement

- Mastering artificial PL production
- High farm gate price
- High potential land & climate
- Labor forces

- Economic reform
- Adoption of a market socialism program
The strong identity of Mekong Delta’s production through the mixed shrimp mangrove system, that is used to support the whole Vietnamese production on international markets (additional value and mighty character of mangrove). On another side, such systems are low productive.

An ambiguous or an agile/clever discourse

The position of rent deduction for the government influences the evolution and the development of shrimp farming as well as its impact. In Vietnam, as in most other countries, this deduction is placed at export level, the end of the production process and much easier to control (no VAT at farm level).

While public authorities are aware of environmental issues, this distribution system sets up certain driving forces that lead to maximize yields per unit of available area or the national production. In this context, the main objectives of seeking foreign currencies, the poverty alleviation and protecting the environmental are difficult to combine together.
SF development in Vietnam

2003: 546 757 ha, 215 504 tons, 394 Kg/ha  
2005: 300 000 tons

Planning for brackish water shrimp culture in coastal areas according to available culture systems

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th></th>
<th></th>
<th>2010</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Production systems</td>
<td>Productivity (kg/ha)</td>
<td>Area (ha)</td>
<td>Volume (tons)</td>
<td>Productivity (kg/ha)</td>
<td>Area (ha)</td>
</tr>
<tr>
<td>Extensive</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Improved Extensive</td>
<td>-</td>
<td>285 600</td>
<td>142 800</td>
<td>-</td>
<td>319 400</td>
</tr>
<tr>
<td>In which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- shrimp/rice</td>
<td>400</td>
<td>185 000</td>
<td>74 000</td>
<td>500</td>
<td>218 000</td>
</tr>
<tr>
<td>- specialized shrimp only</td>
<td>700</td>
<td>100 600</td>
<td>68 800</td>
<td>850</td>
<td>101 400</td>
</tr>
<tr>
<td>Semi-intensive</td>
<td>1 200</td>
<td>76 500</td>
<td>91 800</td>
<td>1 300</td>
<td>76 500</td>
</tr>
<tr>
<td>Intensive</td>
<td>3 000</td>
<td>21 800</td>
<td>65 400</td>
<td>4 000</td>
<td>28 000</td>
</tr>
<tr>
<td>Total</td>
<td>781.4</td>
<td>383 900</td>
<td>300 000</td>
<td>943.7</td>
<td>423 900</td>
</tr>
</tbody>
</table>

(Ministry of Fisheries, Vietnam & Institute of Fisheries Economics and Planning, Hanoi 2001)

This takes place in a context where environmentalists’ voices about SF emerge in main importing countries. (as an answer?)
Why prawns will make you sick

Eating prawns has major environmental and human rights consequences.

EJF has spent 18 months investigating these impacts and is campaigning for fundamental change in the way prawns (also known as shrimp) are produced.

To read more about the impacts of shrimp production, click here.

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waste

Trawlers catch and discard up to 20kg of marine life for just 1kg of prawn. In farms, prawns are fed over twice their weight in fish before they are sold...

hunger

Prawn trawling has devastated local fish stocks, leaving poor, local fishers unemployed and hungry. Prawn farms have ruined land and polluted water and reduced food security...

violence

Prawn farms have brought conflict to coastal communities. Threats, intimidation, arson, violence and rape have ensued...

destruction

Prawn farms destroy coastal forests and threaten coral reefs and marine wildlife...

...you can stop it.
Sustainability issues

Shrimp development history

From Béné C. (2003; www.poressfa.org)

- Technical answers claim for high price to ensure their economic viability.
### Sustainability issues

New bans (partial or total) over producing countries due to residues of drugs (Nitrofuran and Fluoroquinolones)

<table>
<thead>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestication</td>
<td>VN</td>
<td>THD</td>
<td>China (US FDA)</td>
<td>Domestcation of Penaeus monodon??</td>
</tr>
<tr>
<td>BMPs</td>
<td>of Penaeus vannamei</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guidelines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CoC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental friendly approaches</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Developing and implementing BMPs (labeling, close systems, technical answers), internalizing SF’s externalities, picking up and integrating the environmentalists discourse, led to a form of “technical sustainability” (at least for P. vannamei, the Pacific White Shrimp) and then an increase in world production, no longer regulated by local collapses.

"Our competitor is not India or Vietnam, Our competitor is pork."

Chingchai Lohawatanakul, chief executive of Charoen Pokphand Foods (CP Foods)

- Shrimp prices fall, inducing specialization or turn back to risky species, but consumption will grow even more. New markets are emerging (SEA, ...).
Shrimp trade has not grown as much in value than in quantity terms in recent years.

Urner Barry’s Black Tiger Shrimp Price Index from 1999 to 2004
Price evolution according to export quantities of Tahitian black pearls oyster.
Some Questions

- Problem of production systems? Which one to promote? Where?
- According to what kind of organisation? (technical choices, practices, management)
- What production is sustainable? What does that mean?
  - the most efficiency from a technical point of view or from an economic point of view (profitability)?
  - the most environmentally friendly?
  - the most socially efficient or just?
Each of these kind of organisations answer to a different logic

The different logics can be illustrated through three main kind of organisations (without any exhaustivity aim):

• A familial farm from the Mekong delta based on extensive or traditional technique

• An intensive farm typical of Thailand or Indonesia

• large scale farms developed as private real estate farms: 'Inti-Plasma' or NESS (Nucleus Estate Smallholders Scheme)
SD: Stocking Density in 1,000 PL / ha as a global indicator.

PT. Dipasena
9,000 farms
4,500 ha / 15,300 tons
SD 250
1,700 kg/ha/crop

PT. Bratasena
Still in Construction 1996

Labuhan Maringgai
1,159 farms
1,962 ha / 2,021 tons
SD 46
515 kg/ha/crop

Jabung
928 farms
1,167 ha / 603.5 tons
SD 28
181 kg/ha/crop

Palas
200 farms
537 ha / 204 tons
SD 30
190 kg/ha/crop

Penengahan
389 farms
1,095 ha / 824.8 tons
SD 55
377 kg/ha/crop

Kalianda
12 farms
90 ha / 233 tons
SD 150
1,294 kg/ha/crop

Padang Cermin
40 farms
144 ha / 498.3 t
SD 115
1,730 kg/ha/crop

North of Java sea coast
(Pantai Timur)

South of Java sea coast

Indian ocean coralline bays

Plasma Farms

Typical farm of South of Java sea coast

SD: Stocking Density in 1,000 PL / ha as a global indicator.
Tra Vinh: Semi extensive and S-I shrimp farms

Southern Ca Mau: mixed shrimp mangrove
ECONOMIC PERFORMANCE

Profit Rate

Stocking Density

Yield Monodon Dry

INTENSIFICATION

Profit rate < 0

RYiel Mon = 0 to 50

SD average < 1.75/m²

SD average < 3/m²

Profit rate > 65%

RYiel Mon = 150 - 275

Profit rate <=44%

RYiel Mon = 50 to 150

SD average > 4/m²

SD average >= 6/m²

Profit rate < 65%

RYiel Mon = 275 - 500

SD average < 6/m²

SD average < 6/m²

RYiel Mon > 500
Production Volume does not mean High Profitability nor Production Quality:

Define indicators to support the decision

Environmental characteristics?
On Mekong delta a set of 7 indicators, chosen among more than 30 ecological parameters, is able to differentiate and characterize several types of environment in terms of water quality. They synthesize the most part of the relevant information related to water quality and aquaculture.

Farms economics & practices? According to experience & performances of sampled farms, environmental friendly practices & technical levels are proposed related to environmental characteristics

Wealth distribution: based on familial farms, surveyed systems are rather close in terms of employment except the most intensive techniques which are less labor intensive (per Kg of shrimps)
All this call for a more integrative approach in terms of sustainability. Sustainability is a complex, multi-dimensional, issue. A common way of simplified representation is the triangle of paradigms. You may work at the corners or at the borders, we chose to work at the heart.
Many of us work at the corners of the sustainability triangle, some on the borders trying to link biology or ecology with economics, efficiency with distribution or ecosystem with social well-being. Even the difficult integration of the three dimensions from the borders, the eco-socio-eco modeling (quantitative or qualitative), doesn’t tell us more about sustainability.

Addressing sustainability means that we translate in terms of public policy/collective action the various dimensions of the sustainability. Profitability of farms, fair distribution of wealth, protection/rehabilitation of ecosystems must be pursued simultaneously to improve the overall contribution to the society and to ensure stronger resilience capacity.

Each of these dimensions should be recognized in terms of specific objectives and specific means of action (some problems are better addressed at the local level other at the global level). But also for their linkages.
Discussion over sustainability issues

Governance for Sustainability

Society / Coastal communities, consumer well-being

Cultural values, representations and institutional arrangements

Collective action

Public policies

Juridical frameworks

Norms and sanctions

Economic and moral incentives

Decision-making processes

Ecosystem / Coastal aquatic and terrestrial bodies

Economy / shrimp farms and ancillary industries
Conclusion

● Focus on the way to produce rather than on the volume by taking advantages of the specificity of Mekong delta’s production in a particular environment (specialization, niche markets when other countries enter in a “mass proteins” production)

● Try to assess the real impact of SF development over a province or a district; even roughly through regional economic tool (regional accounting and greening the accounting in a second step) assessing first direct an indirect effects of SF in terms of market values (what really remains over the exploited area and in the country, analysis of the redistribution system); try to integrate non market value in a second step, taking into account patrimonial values, ecosystems functionalities and landscape (benefit transfer methods).

● The history of shrimp farming appears as a trade-off between economic gains and environmental and social costs with some public policy measures taken in reaction to the negative impacts. Public policy can be defined as all forms of cooperative / collective actions that intend to constrain or orientate individual choices. The challenges of public policy are crucial for the sustainability of shrimp farming that cannot be constrained by only environmental or economic sustainability.
Cám ơn nhiều!
Thank You!
Tra Vinh, SPOT 4 colour composite, 2001-01-01
NESS: Nucleus Estate Smallholders Scheme

This system is based on huge areas developed by an external single investor providing technology, inputs and market outlet to single small farmers managing 1 or 2 ponds under a lease system.

Under well controlled systems and technologies, the nucleus estate try to avoid problems related to other organisation modes.

- high technical level: try to master the environment and reduce risks ("technique is able to bridge any gap")
- very intensive system and smallholders scheme to balance bad technical efficiency
- centralised management
- Integration of all the process (control the uncertain)
- previously inhabited wetland