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

Pascal Raux and Denis Bailly
Université Européenne de Bretagne ; Université de Brest ; UMR AMURE Centre de droit et d’économie de la mer

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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

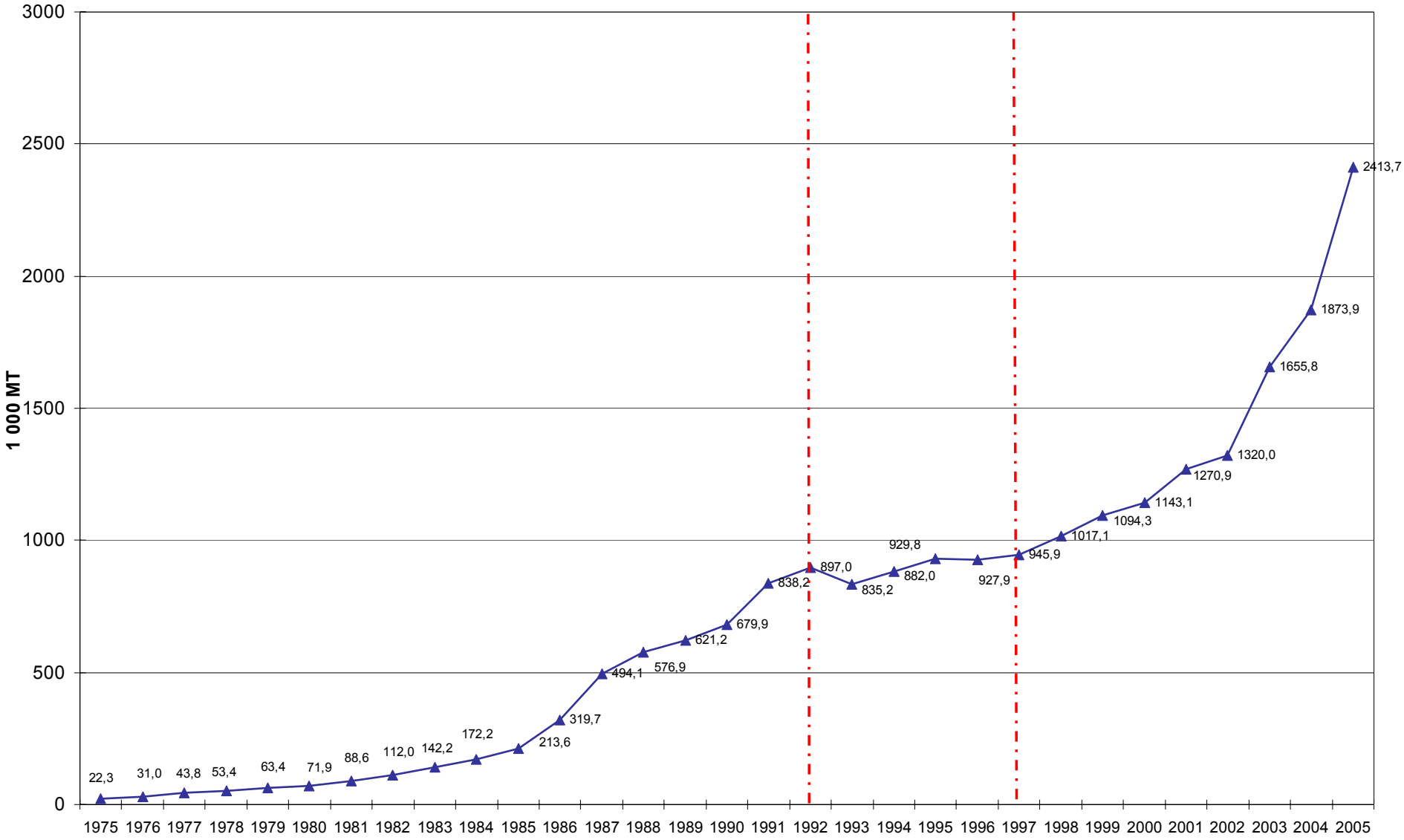
-SF in Vietnam
  -Development History
  -Challenges

-Sustainability Issues

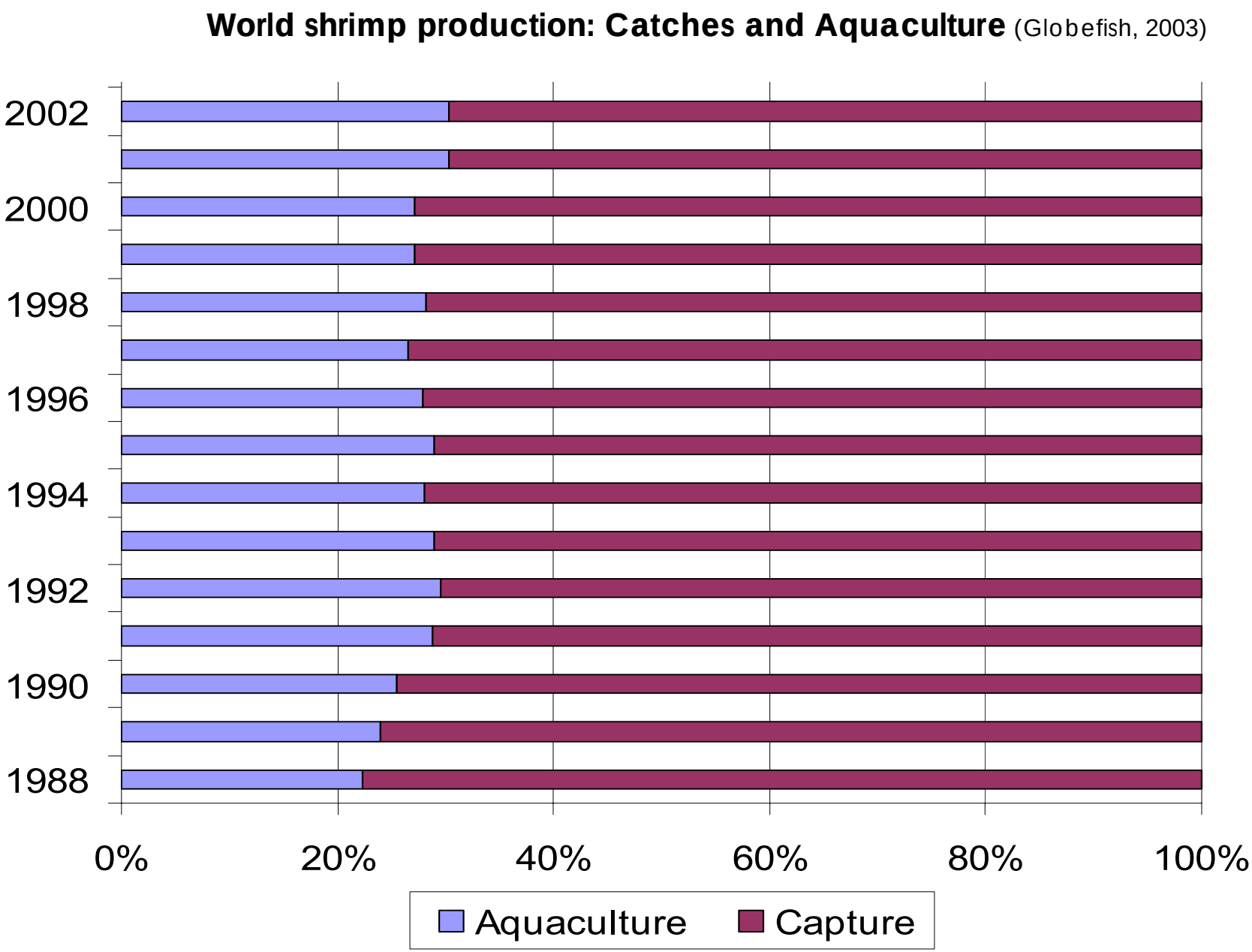
-Conclusion / Discussion

the World context

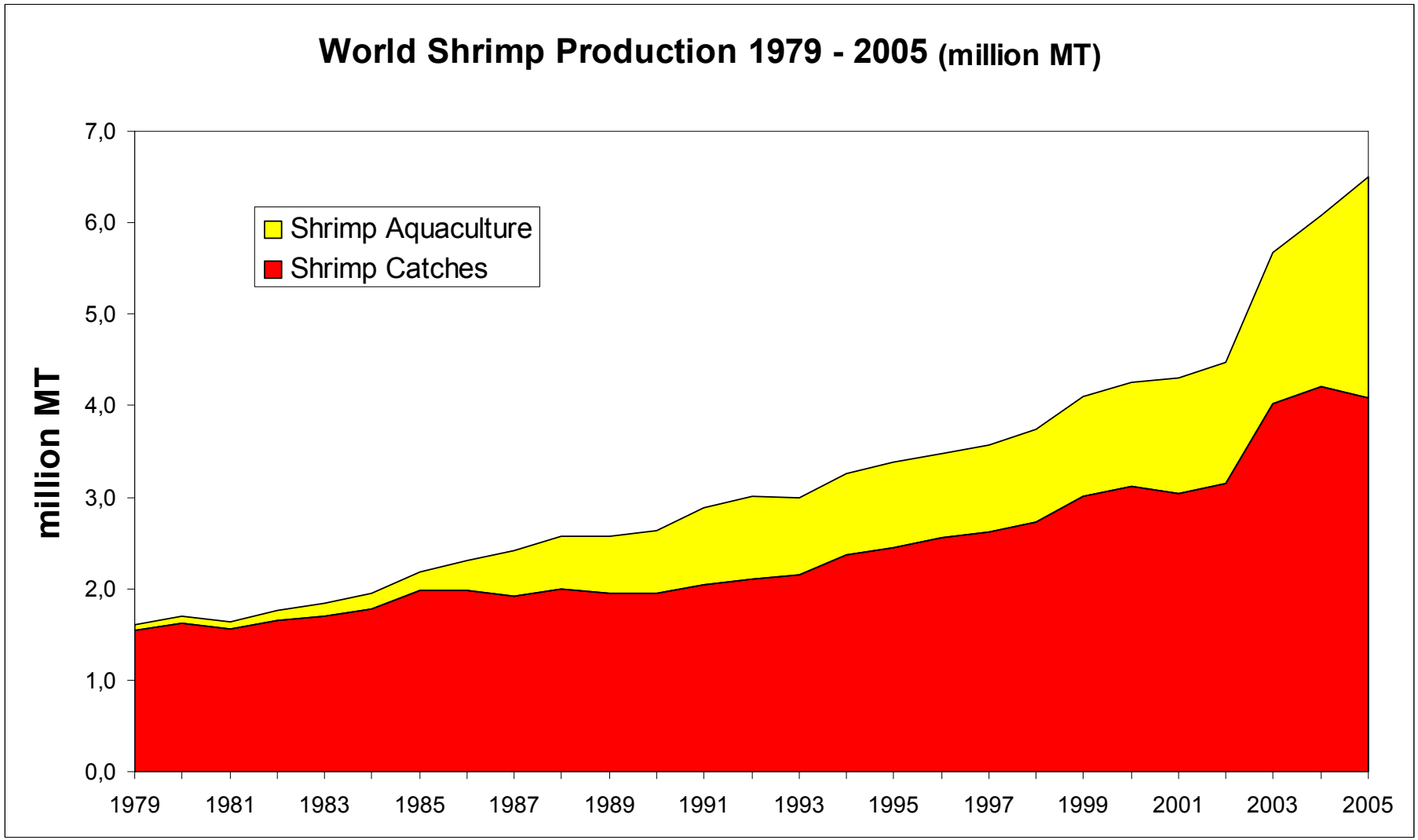
World Shrimp Farming (1 000 MT – Globefish FISHDAB 2006)

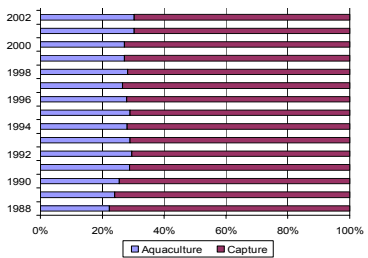


the World context



the World context





(Globefish, 2006)

the World context

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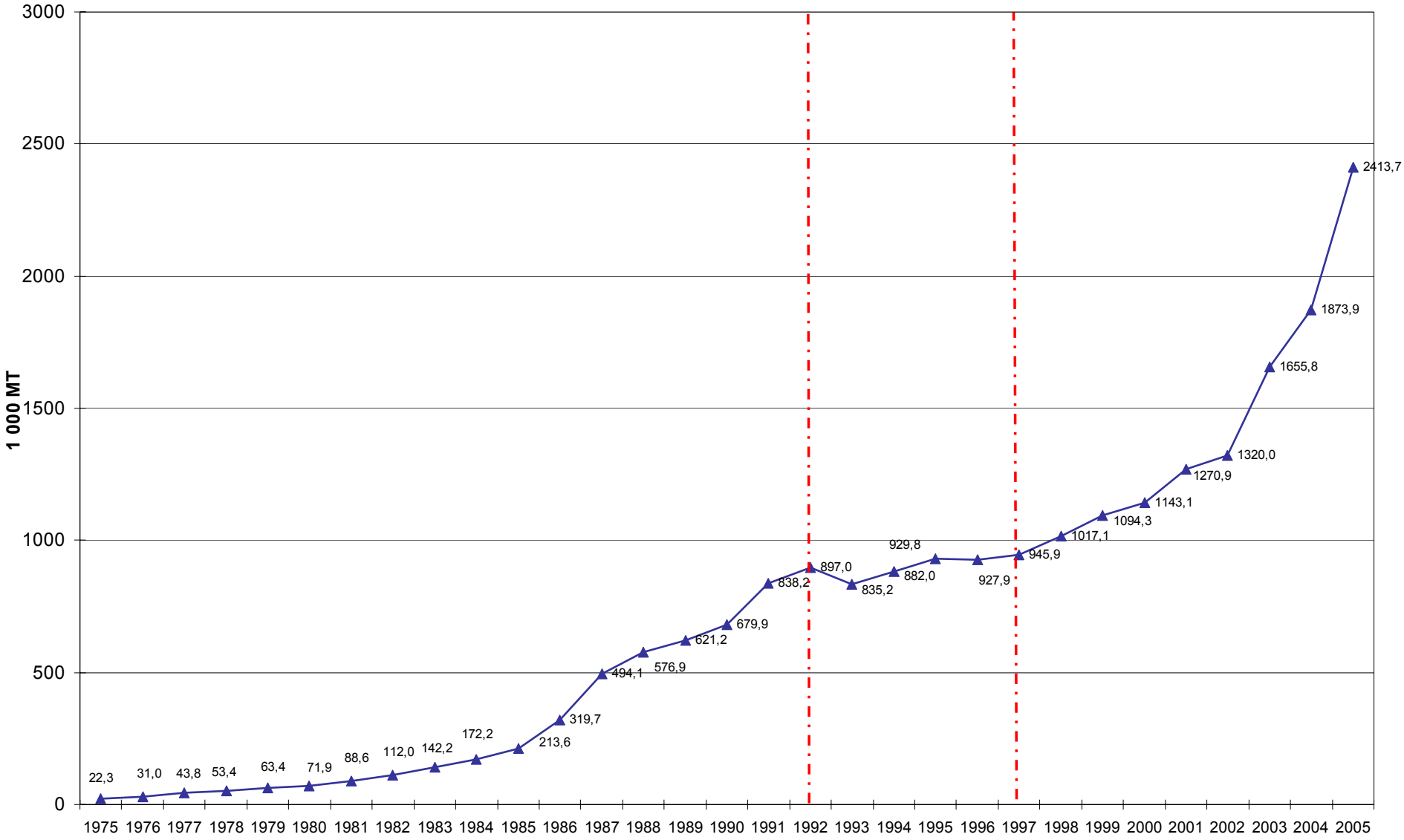
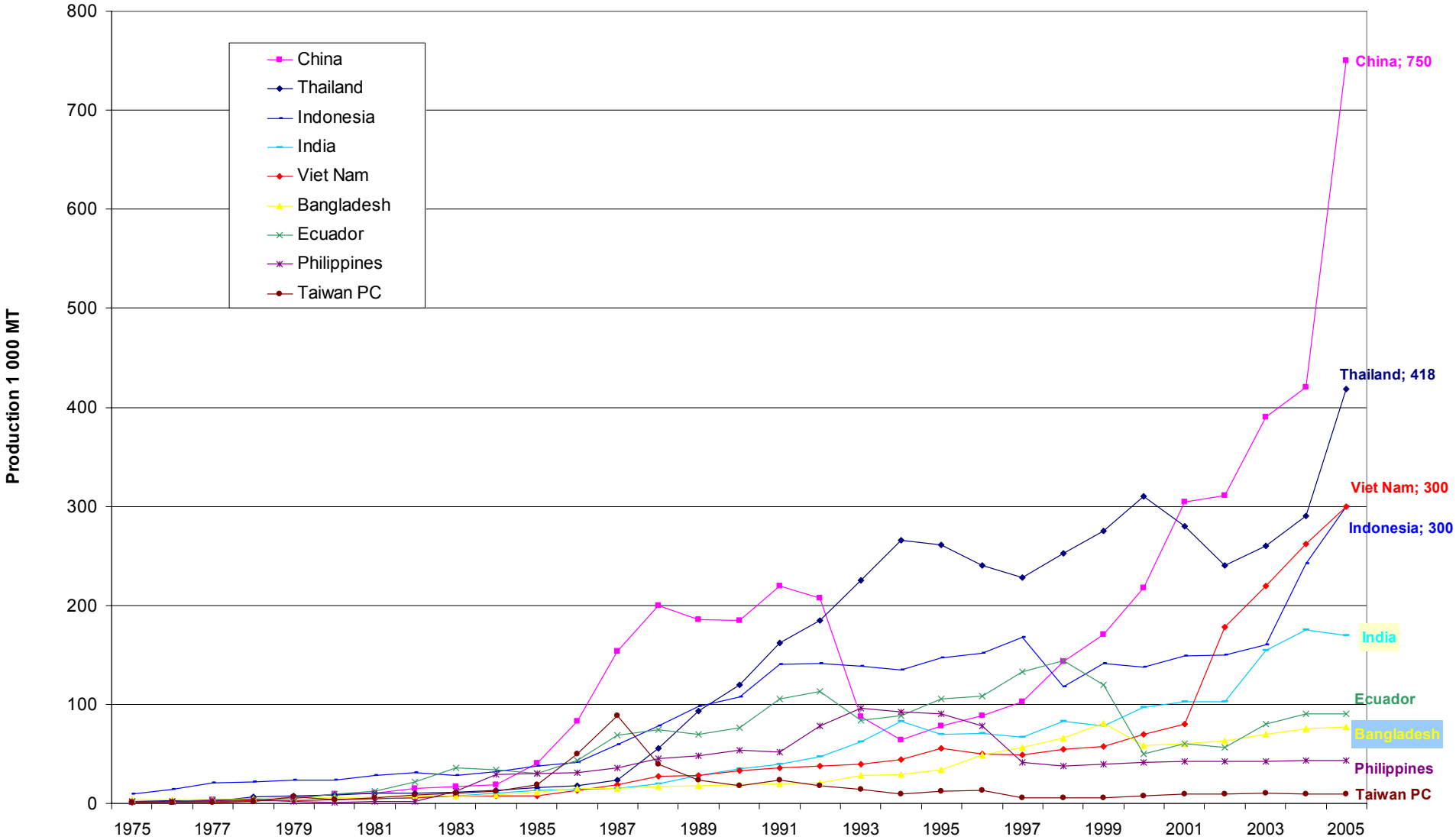


the World context

Estimates of Shrimp Aquaculture Production per country 1975 – 2005 (1 000 MT - Globefish)



the World context (till the end of the 90's beginning of 2000)

Shrimps exportations (head-less) - unit: tons.

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

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)

China	1993 1994	1 000 000 000 USD 400 000 000 USD
Thailand	1996	500 000 000 USD
Ecuador	1999 2000	150 000 jobs lost 580 000 000 USD

SF development in Vietnam

Vietnam presents similar trends in the beginning of its shrimp industry development.

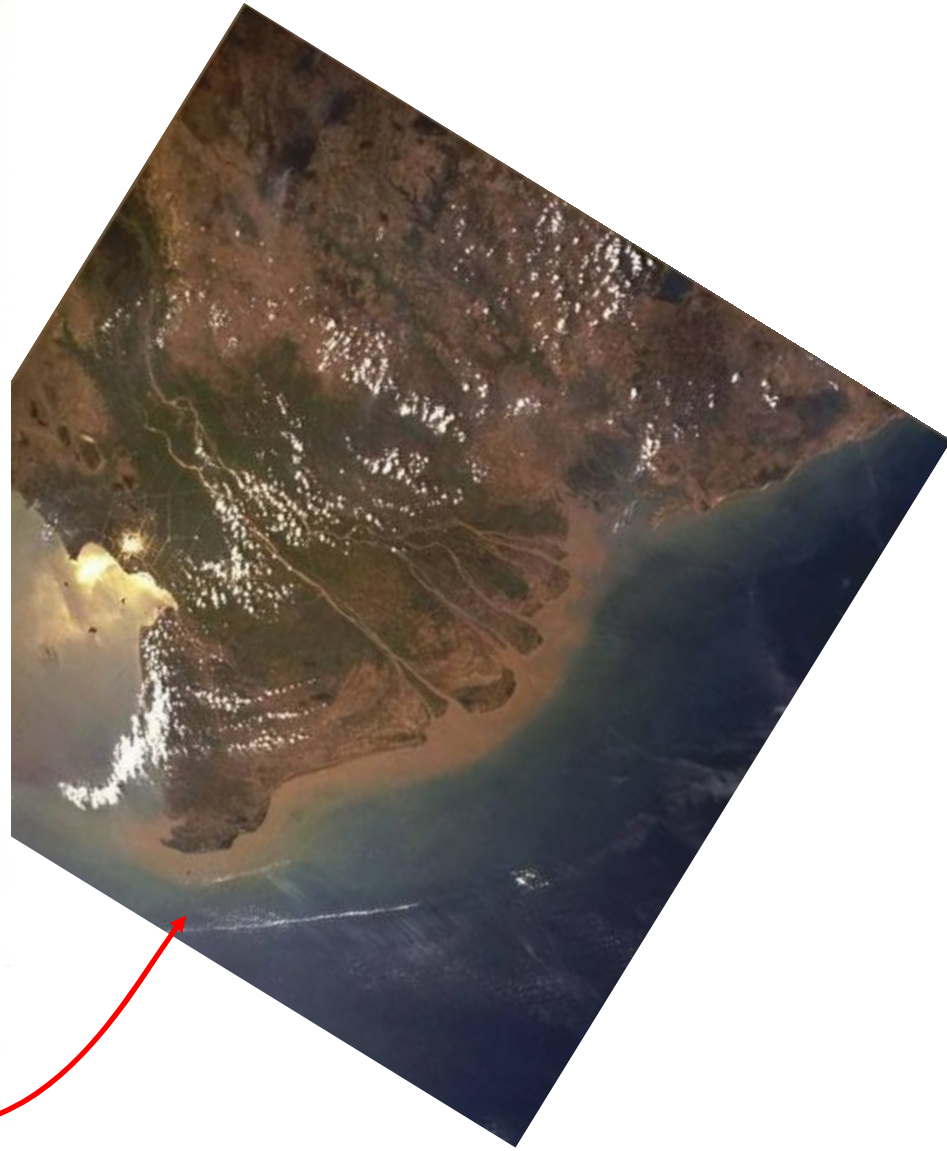
SF is strongly located in the Mekong Delta, enjoying large areas and better climatic conditions, under an important diversity of production systems.

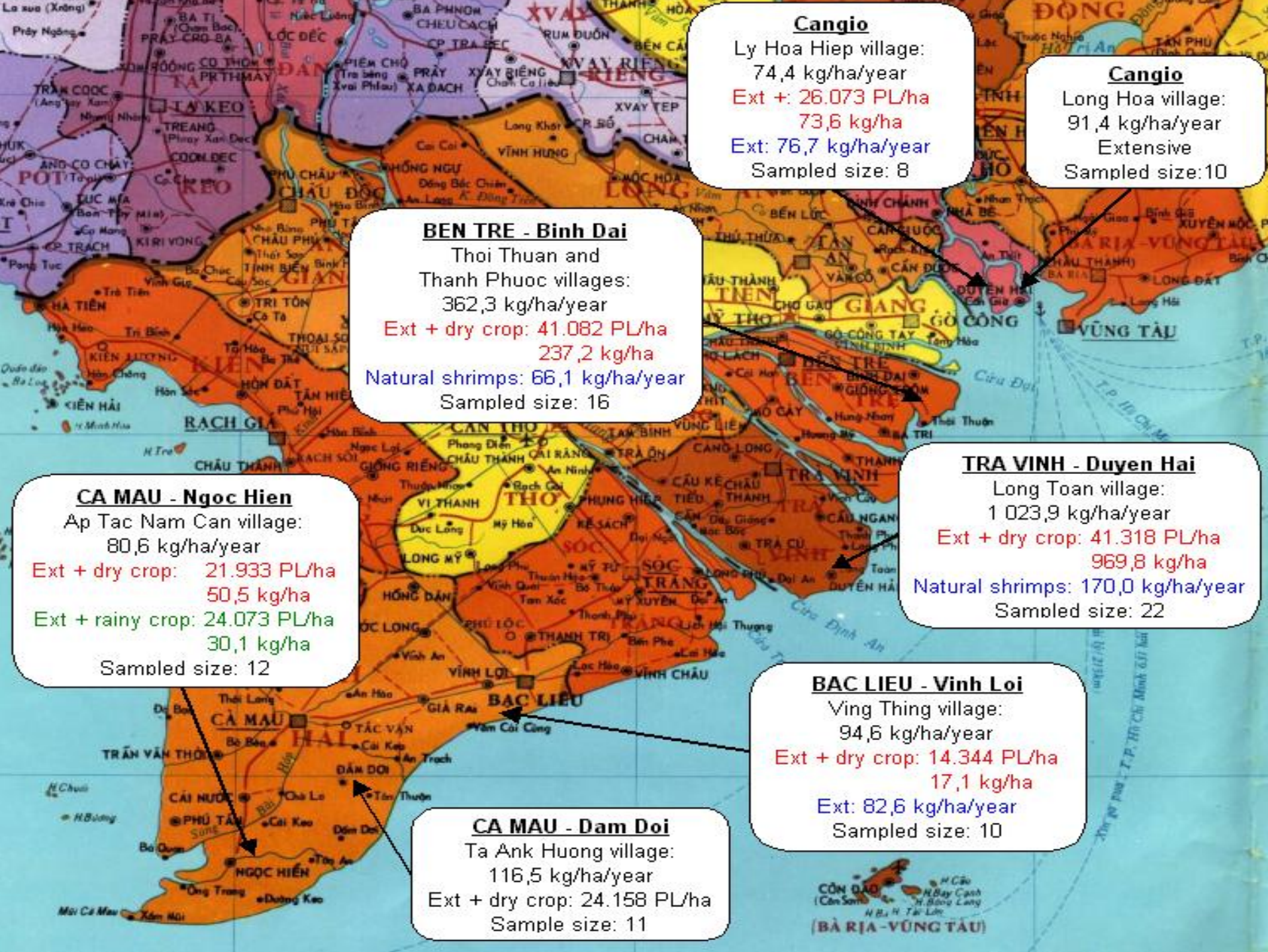
Diện tích nuôi trồng thuỷ sản theo nhóm loài và theo địa phương năm 2003
Aquaculture area by species group and by province in 2003

Đơn vị tính: Ha - Unit: Ha

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

SF is strongly located in Southern provinces



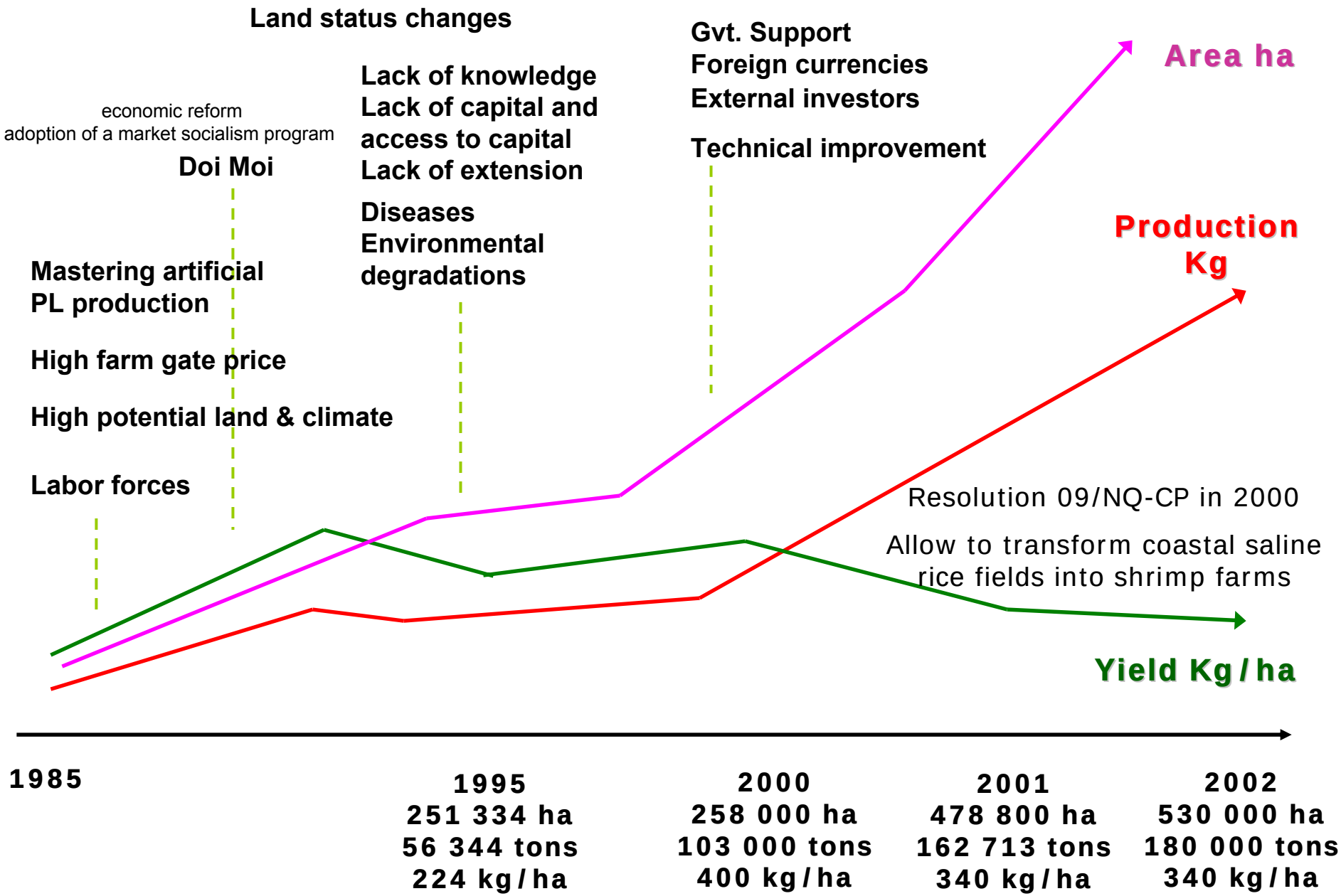

Cangio
Ly Hoa Hiep village:
74,4 kg/ha/year
Ext +: 26.073 PL/ha
73,6 kg/ha
Ext: 76,7 kg/ha/year
Sampled size: 8
Cangio
Long Hoa village:
91,4 kg/ha/year
Extensive
Sampled size:10
BEN TRE - Binh Dai
Thoi Thuan and
Thanh Phuoc villages:
362,3 kg/ha/year
Ext + dry crop: 41.082 PL/ha
237,2 kg/ha
Natural shrimps: 66,1 kg/ha/year
Sampled size: 16
TRA VINH - Duyen Hai
Long Toan village:
1 023,9 kg/ha/year
Ext + dry crop: 41.318 PL/ha
969,8 kg/ha
Natural shrimps: 170,0 kg/ha/year
Sampled size: 22
CA MAU - Ngoc Hien
Ap Tac Nam Can village:
80,6 kg/ha/year
Ext + dry crop: 21.933 PL/ha
50,5 kg/ha
Ext + rainy crop: 24.073 PL/ha
30,1 kg/ha
Sampled size: 12
BAC LIEU - Vinh Loi
Ving Thing village:
94,6 kg/ha/year
Ext + dry crop: 14.344 PL/ha
17,1 kg/ha
Ext: 82,6 kg/ha/year
Sampled size: 10
CA MAU - Dam Doi
Ta Ank Huong village:
116,5 kg/ha/year
Ext + dry crop: 24.158 PL/ha
Sample size: 11

Mixed Mangrove - Shrimp

Rice – Shrimp (rotation)

Shrimps from polyculture systems

Intensive system


Land status changes
Gvt. Support
Foreign currencies
External investors
Area ha
Lack of knowledge
Lack of capital and
access to capital
Lack of extension
economic reform
adoption of a market socialism program
Doi Moi
Technical improvement
Diseases
Environmental
degradations
Production
Kg
Mastering artificial
PL production
High farm gate price
High potential land & climate
Labor forces
Resolution 09/NQ-CP in 2000
Allow to transform coastal saline
rice fields into shrimp farms
Yield Kg / ha
1985
1995
251 334 ha
56 344 tons
224 kg / ha
2000
258 000 ha
103 000 tons
400 kg / ha
2001
478 800 ha
162 713 tons
340 kg / ha
2002
530 000 ha
180 000 tons
340 kg / ha

SF development in Vietnam

- **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**

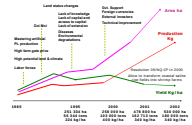
The position of rent deduction for the government influences the evolution and the development of shrimp farming as well as its impact. In Vietnam, as in most other countries, this deduction is placed at export level, the end of the production process and much easier to control (no VAT at farm level).

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 504tons, 394Kg/ha

2005: 300 000 tons



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

Year	2005			2010		
Production systems	Productivity (kg/ha)	Area (ha)	Volume (tons)	Productivity (kg/ha)	Area (ha)	Volume (tons)
Extensive	-	-	-	-	-	-
Improved Extensive	-	285 600	142 800	-	319 400	193 600
In which:						
-shrimp/rice	400	185 000	74 000	500	218 000	109 000
-specialized (shrimp only)	700	100 600	68 800	850	101 400	84 600
Semi-intensive	1 200	76 500	91 800	1 300	76 500	97 200
Intensive	3 000	21 800	65 400	4 000	28 000	109 250
Total	781.4	383 900	300 000	943.7	423 900	400 050

(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.

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

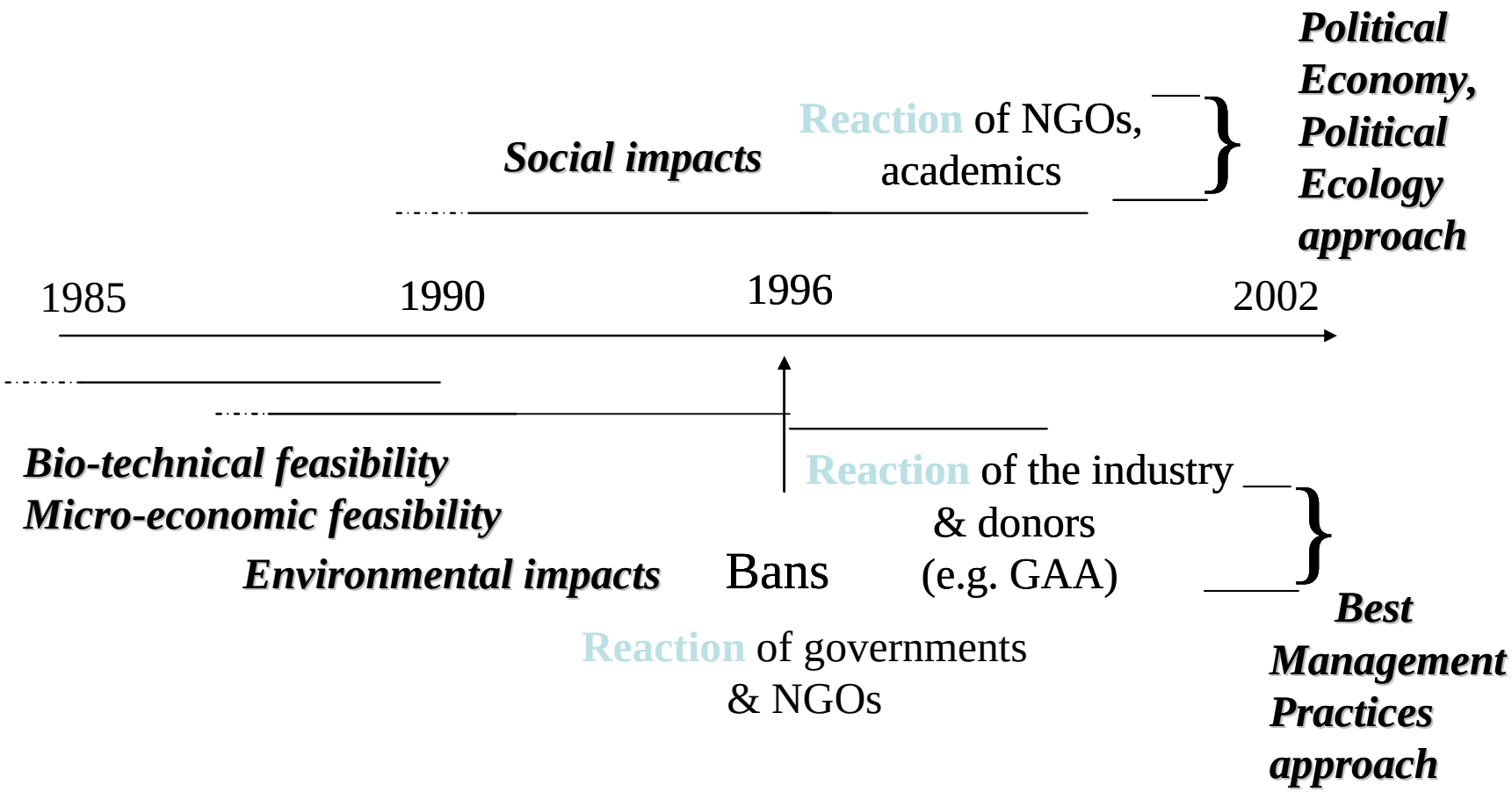
Prawn farms have bought conflict to coastal communities. Threats, intimidation, arson, violence and rape have ensued...

destruction

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

...you can stop it.

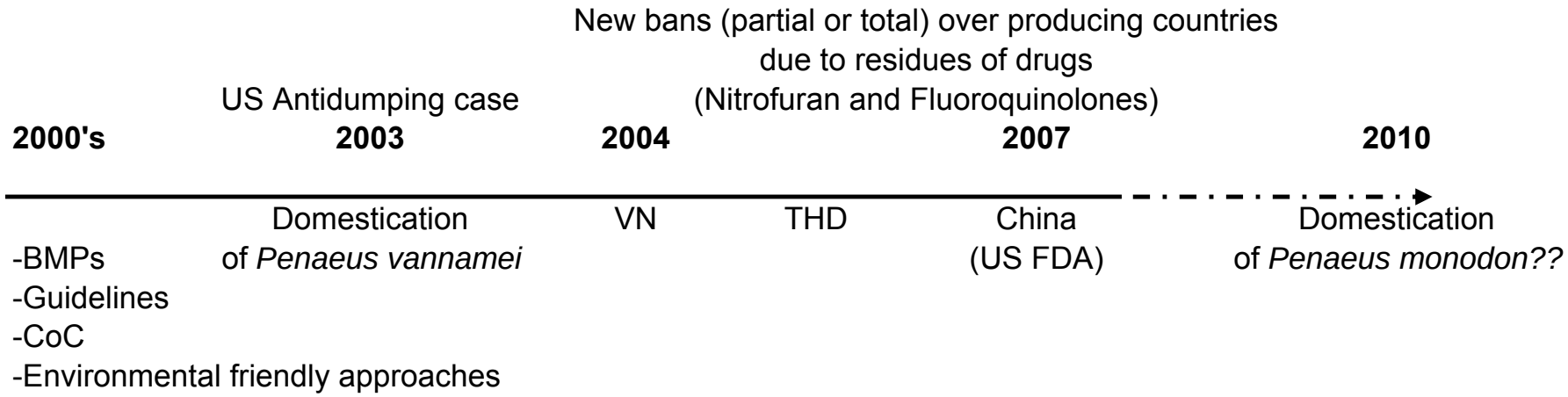
Shrimp development history



From Béné C. (2003; www.poressfa.org)

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

Sustainability issues



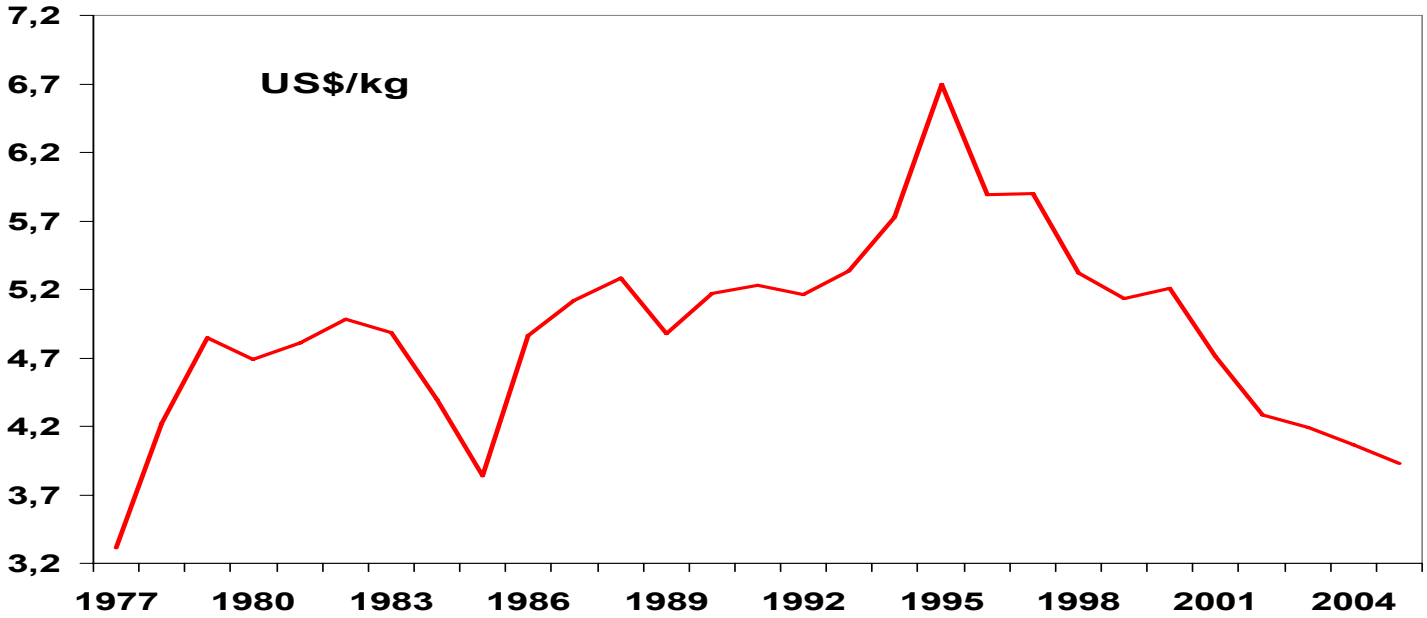
- Developing and implementing BMPs (labeling, close systems, technical answers), internalizing SF's externalities, picking up and integrating the environmentalists discourse, led to a form of "technical sustainability" (at least for *P. vannamei,* the Pacific White Shrimp) and then an increase in world 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)

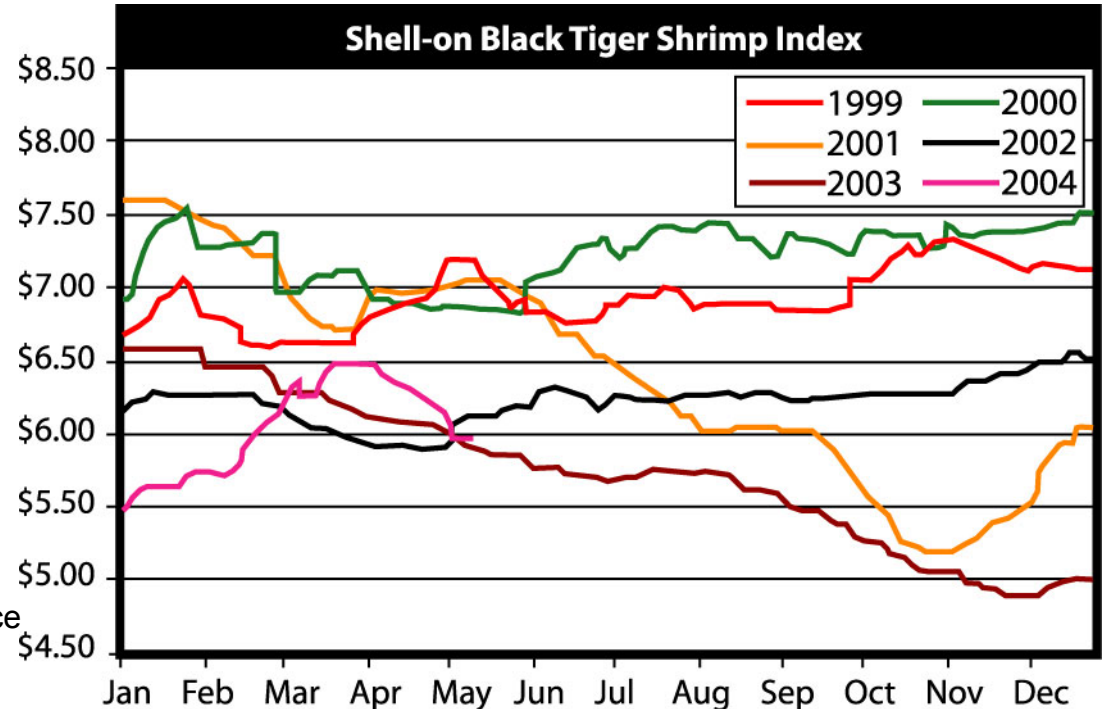
- shrimp prices fall, inducing specialization or turn back to risky species, but consumption will grow even more. New markets are emerging (SEA, ...).

Shrimp Unit Value (liveweight equivalent)



GLOBEFISH

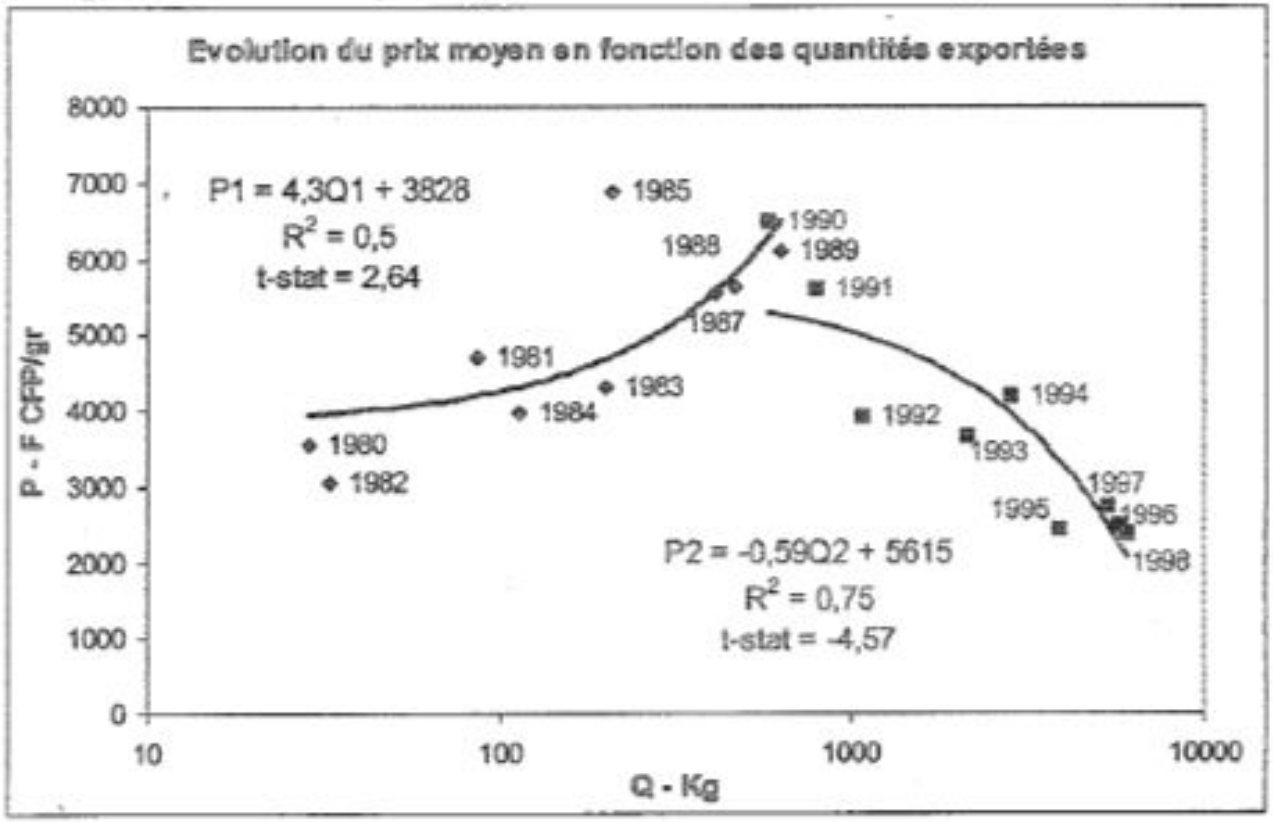
Shrimp trade has not grown as much in value than in quantity terms in recent years.



Urner Barry's Black Tiger Shrimp Price Index from 1999 to 2004

Price evolution according to export quantities of Tahitian black pearls oyster

Figure 4 : Evolution du prix moyen en valeur FOB en fonction des quantités exportées



Sustainability issues

- 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 doest that mean?

    -the most efficiency from a technical point of view or from an economic point of view (profitability)?

    -the most environmental friendly?

    -the most socially efficient or just?

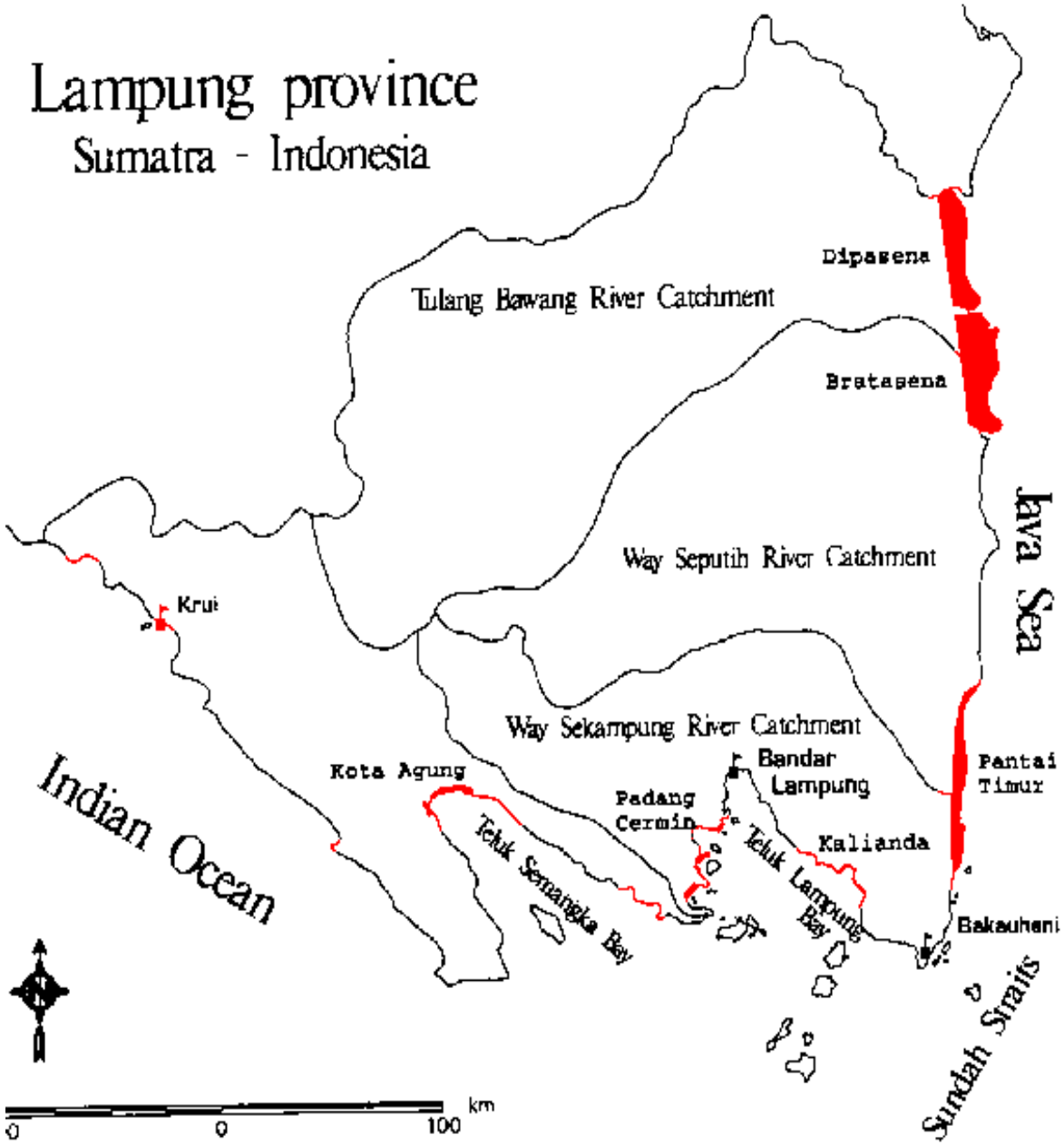
Each of these kind of organisations answer to a different logic

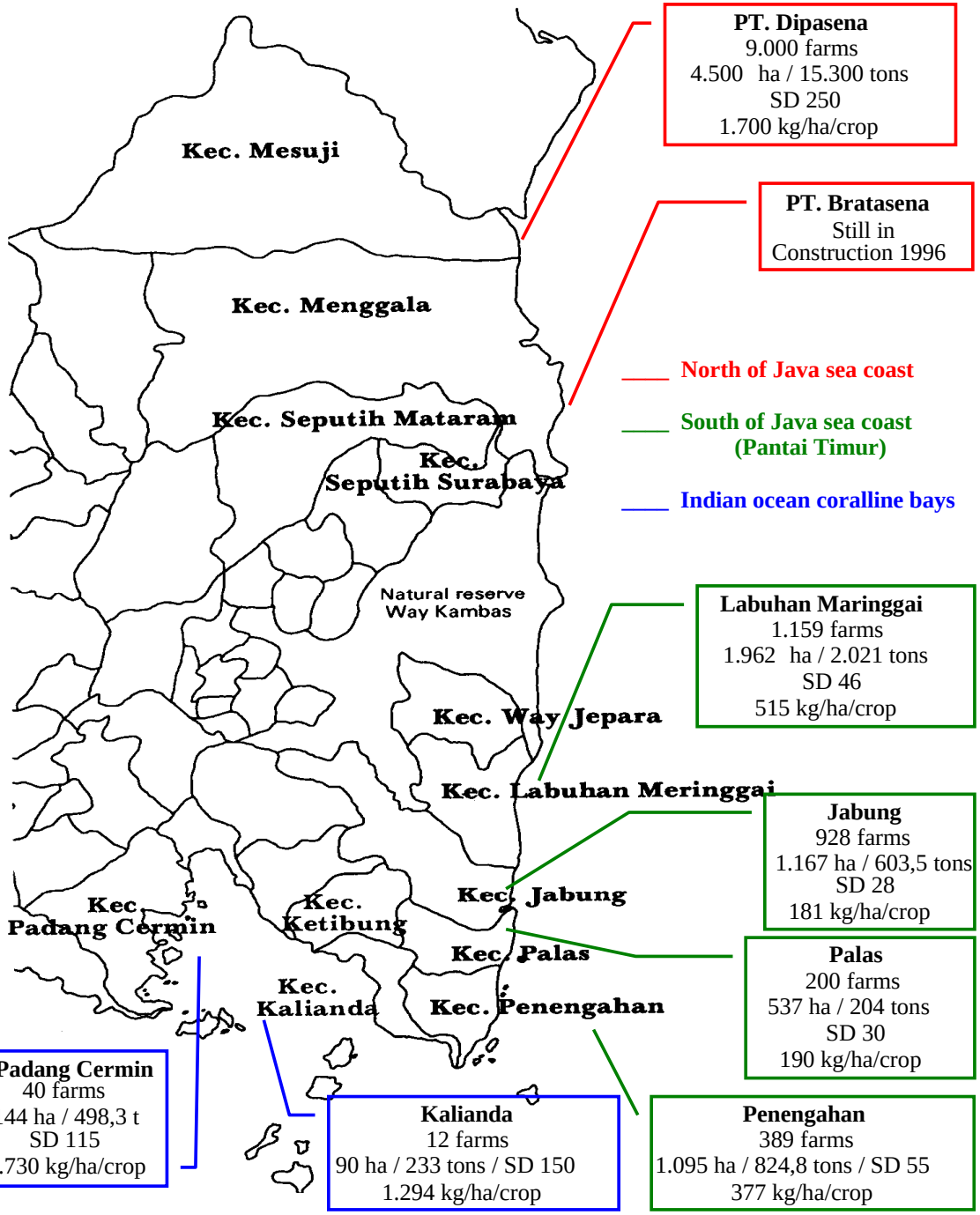
The different logics can be illustrated through three main kind of organisations (without any exhaustivity aim):

- **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)**


Lampung province
Sumatra - Indonesia
Dipasena
Tulang Bawang River Catchment
Bratasena
Java Sea
Way Seputih River Catchment
Krui
Way Sekampung River Catchment
Bandar Lampung
Pantai Timur
Kota Agung
Padang Cermin
Kalianda
Teluk Semangka Bay
Teluk Lampung Bay
Bakauheni
Indian Ocean
Sunda Straits
0
0
100
km



PT. Dipasena
9.000 farms
4.500 ha / 15.300 tons
SD 250
1.700 kg/ha/crop

PT. Bratasena
Still in Construction 1996

North of Java sea coast

South of Java sea coast (Pantai Timur)

Indian ocean coralline bays

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

Padang Cermin
40 farms
144 ha / 498,3 t
SD 115
1.730 kg/ha/crop

Kalianda
12 farms
90 ha / 233 tons / SD 150
1.294 kg/ha/crop

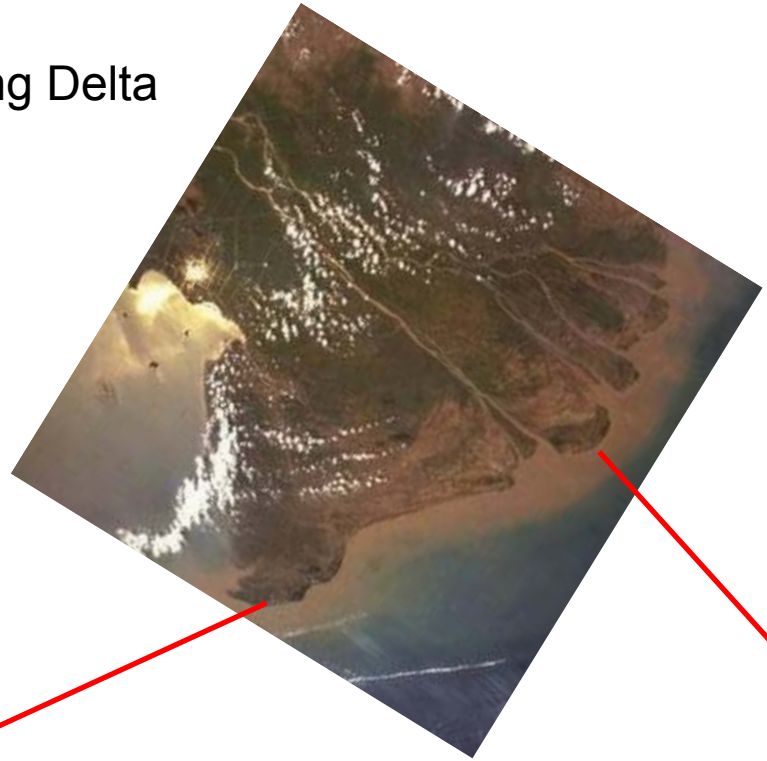
Penengahan
389 farms
1.095 ha / 824,8 tons / SD 55
377 kg/ha/crop

Plasma Farms

Typical farm of South of Java sea coast

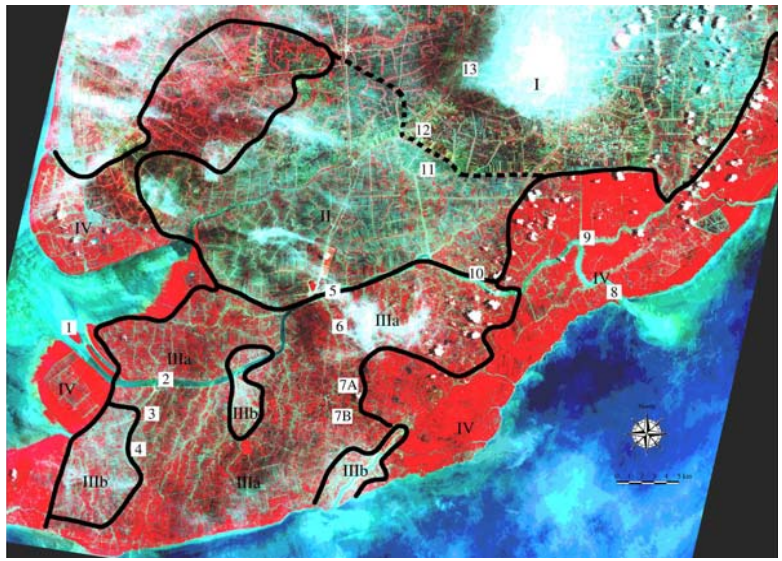
SD: Stocking Density in 1.000 PL / ha as a global indicator.

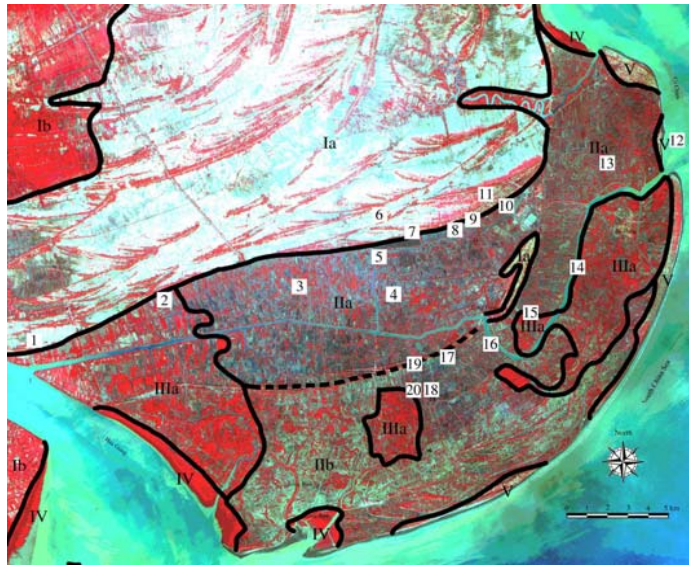
Mekong Delta



Ca Mau

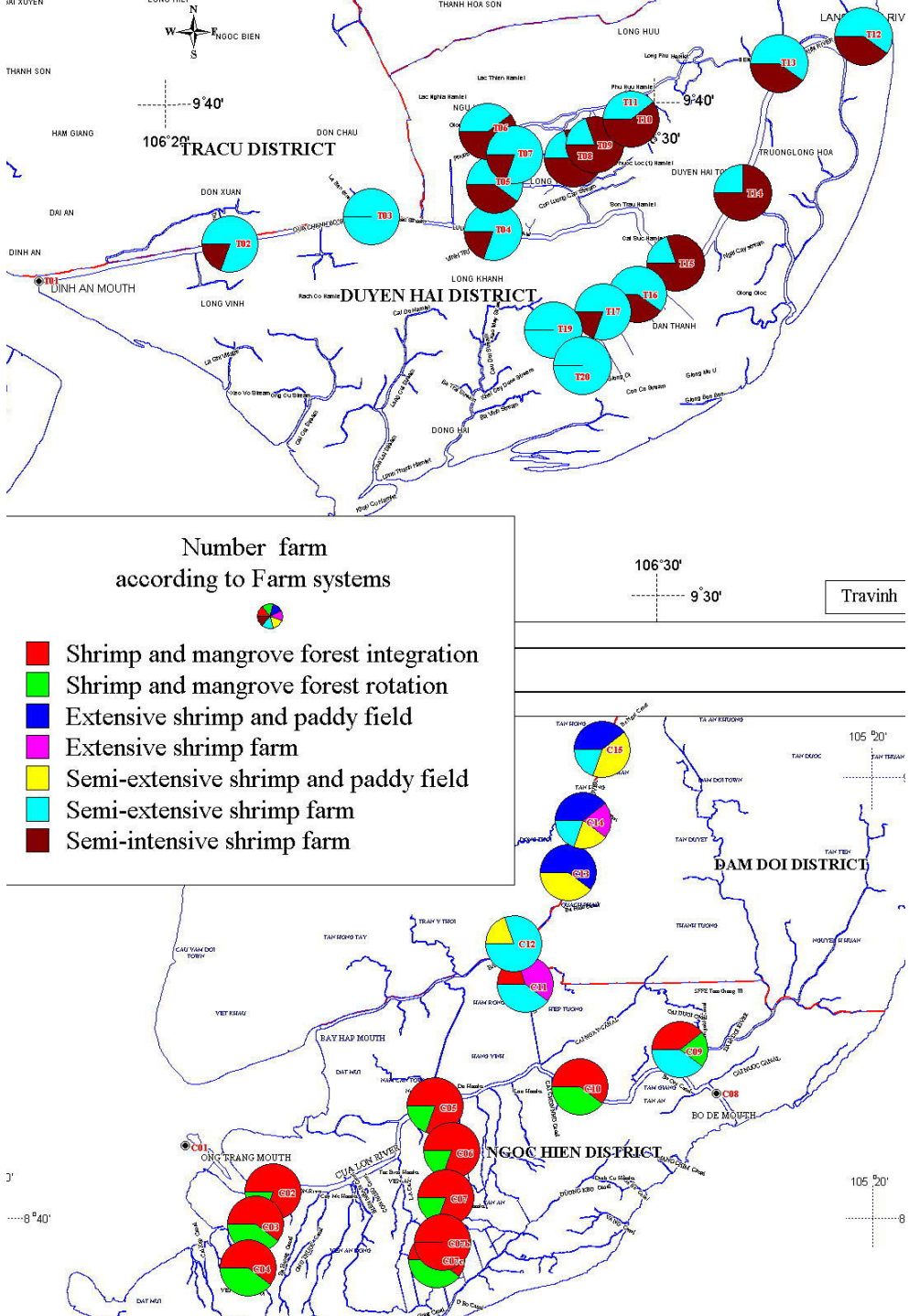
Tra Vinh



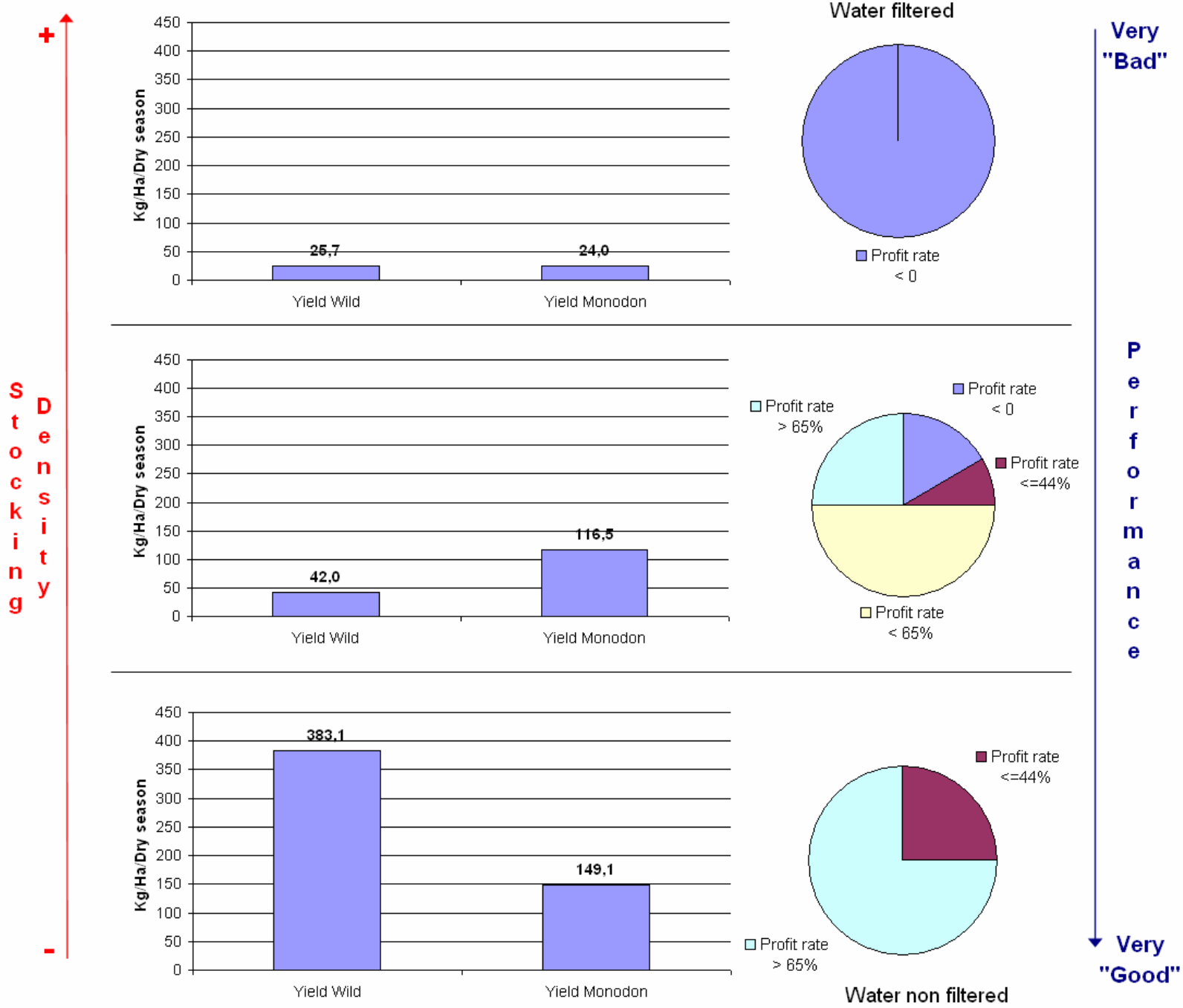


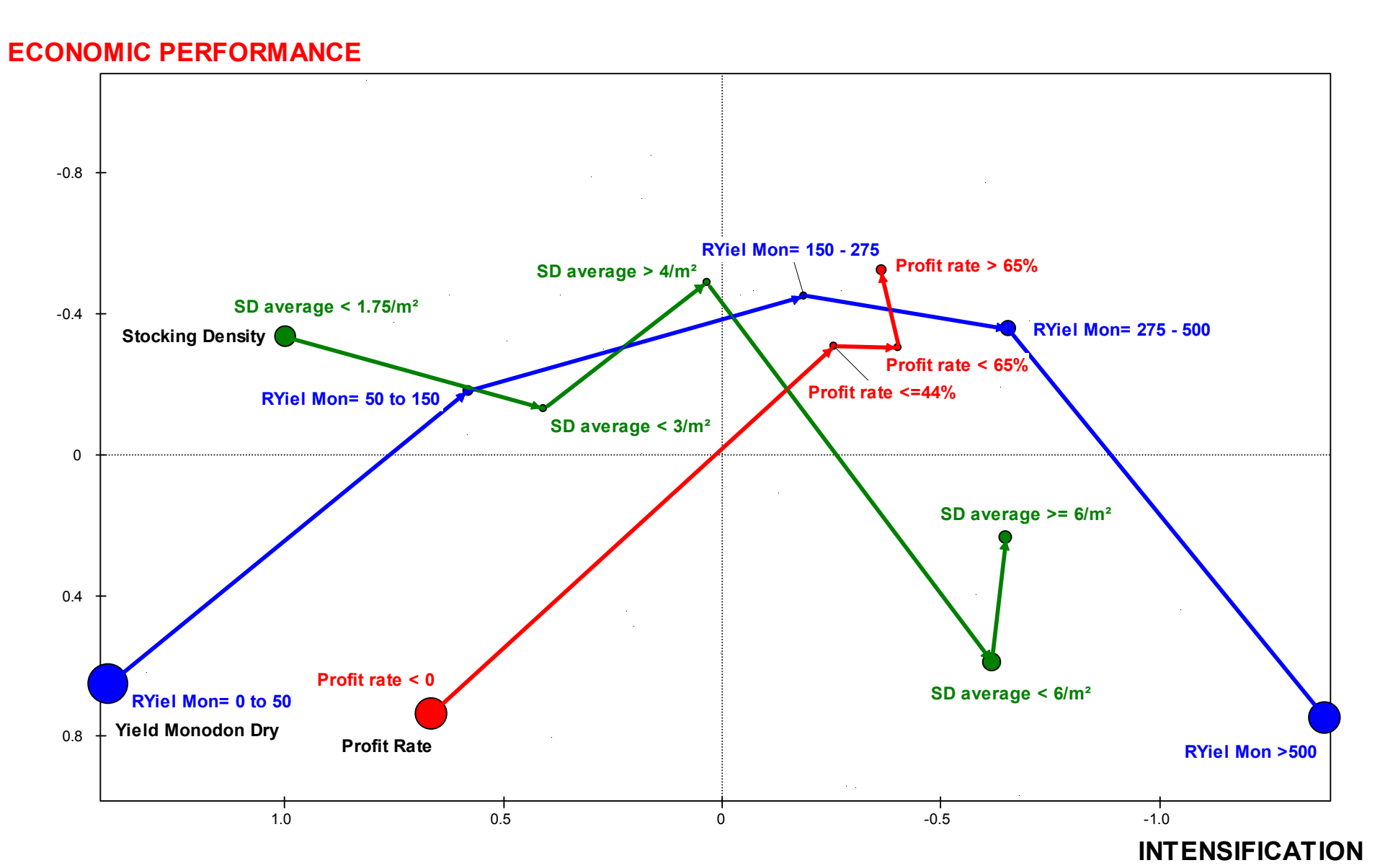
Tra Vinh: Semi extensive and S-I shrimp farms

Southern Ca Mau: mixed shrimp mangrove



Ca Mau Mixed Shrimp/Mangrove Systems




ECONOMIC PERFORMANCE
-0.8
-0.4
0
0.4
0.8
1.0
0.5
0
-0.5
-1.0
INTENSIFICATION
Stocking Density
SD average < 1.75/m²
SD average > 4/m²
RYiel Mon= 150 - 275
Profit rate > 65%
RYiel Mon= 275 - 500
Profit rate < 65%
Profit rate <=44%
RYiel Mon= 50 to 150
SD average < 3/m²
SD average >= 6/m²
RYiel Mon= 0 to 50
Yield Monodon Dry
Profit rate < 0
Profit Rate
SD average < 6/m²
RYiel Mon >500

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.

Measures of the indicators on the selected area → **Environmental Typology Result:**

Indicators:	Measures:
pH	7.7
Salinity	29.45
TSS	75.95
BOD	2.75
Vibrio	19
DO	4.545
Confinement Index CI	1.395

$CI = D / \sqrt{S}$ D = Distance from sea-shore; S = Cross section of the river or channel at the station

Indicators:	V-Test
BOD	+
Salinity	+
Vibrio	+
Confinement Index CI	+
TSS	-
pH	-
DO	-

High level compare to the average value

Average value zone

Low level compare to the average value

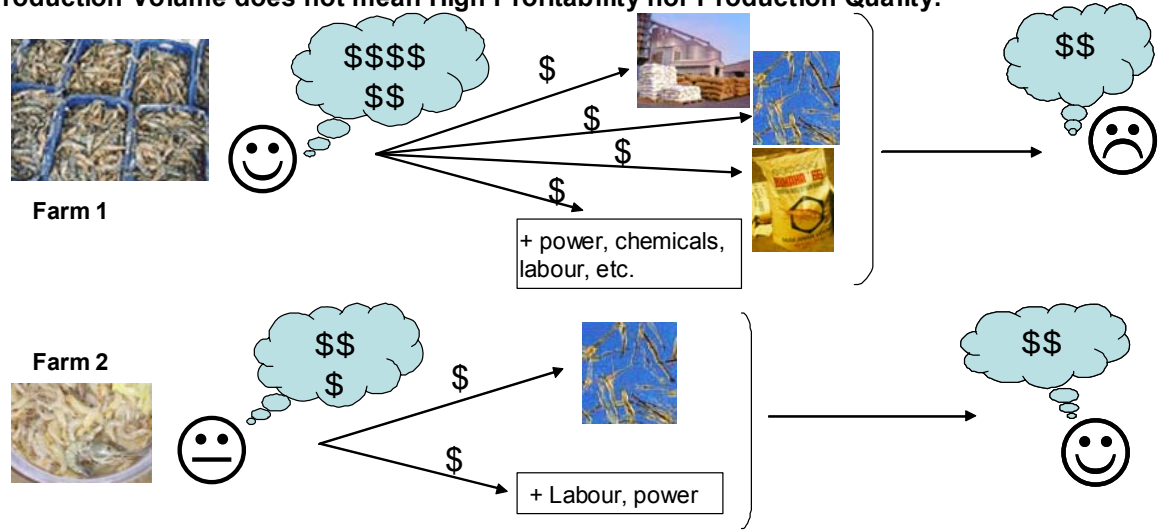
Identification of station characteristics & recommendations

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

Ecological characteristics of sampled stations		Less risky Systems	Practices	Profitability/Risk
Type 2	High Bacteria, high salinity	Mixte shrimp/mangrove Theory: No Monodon stocking If stocking no more 0.5 PL/m², based on wild shrimp aquaculture	No artificial feed and very low fresh feed, no juvenile (no technico-economically efficient), acclimation, High water renewal frequency, a minimum pond preparation (if Stocking); Redesign pond: keep mangrove under tidal rythm.	VeryGood profitability

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)

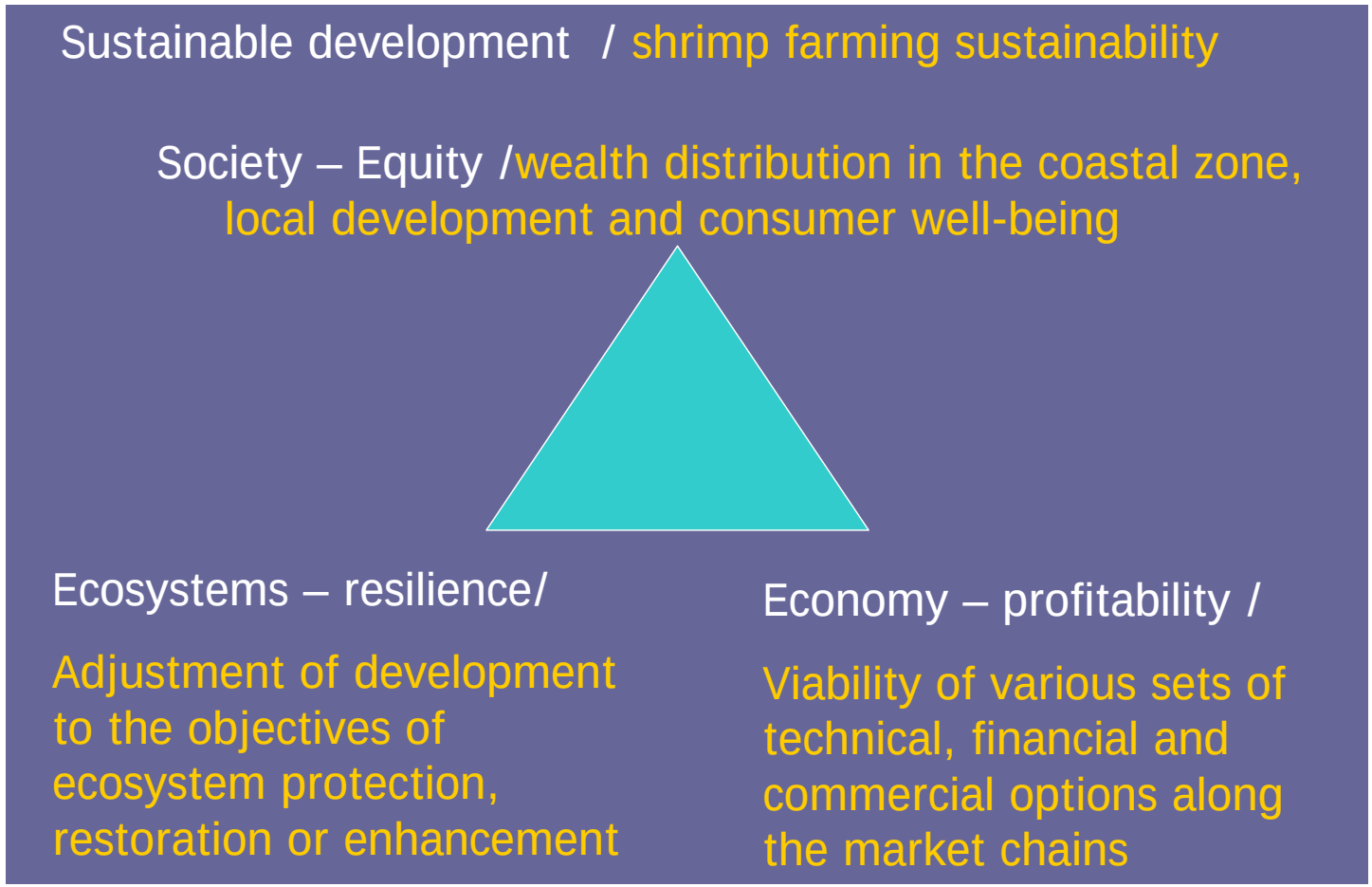
Production Volume does not mean High Profitability nor Production Quality:



Rise farmers' consciousness

Discussion over sustainability issues

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.



The sustainability triangle of paradigms

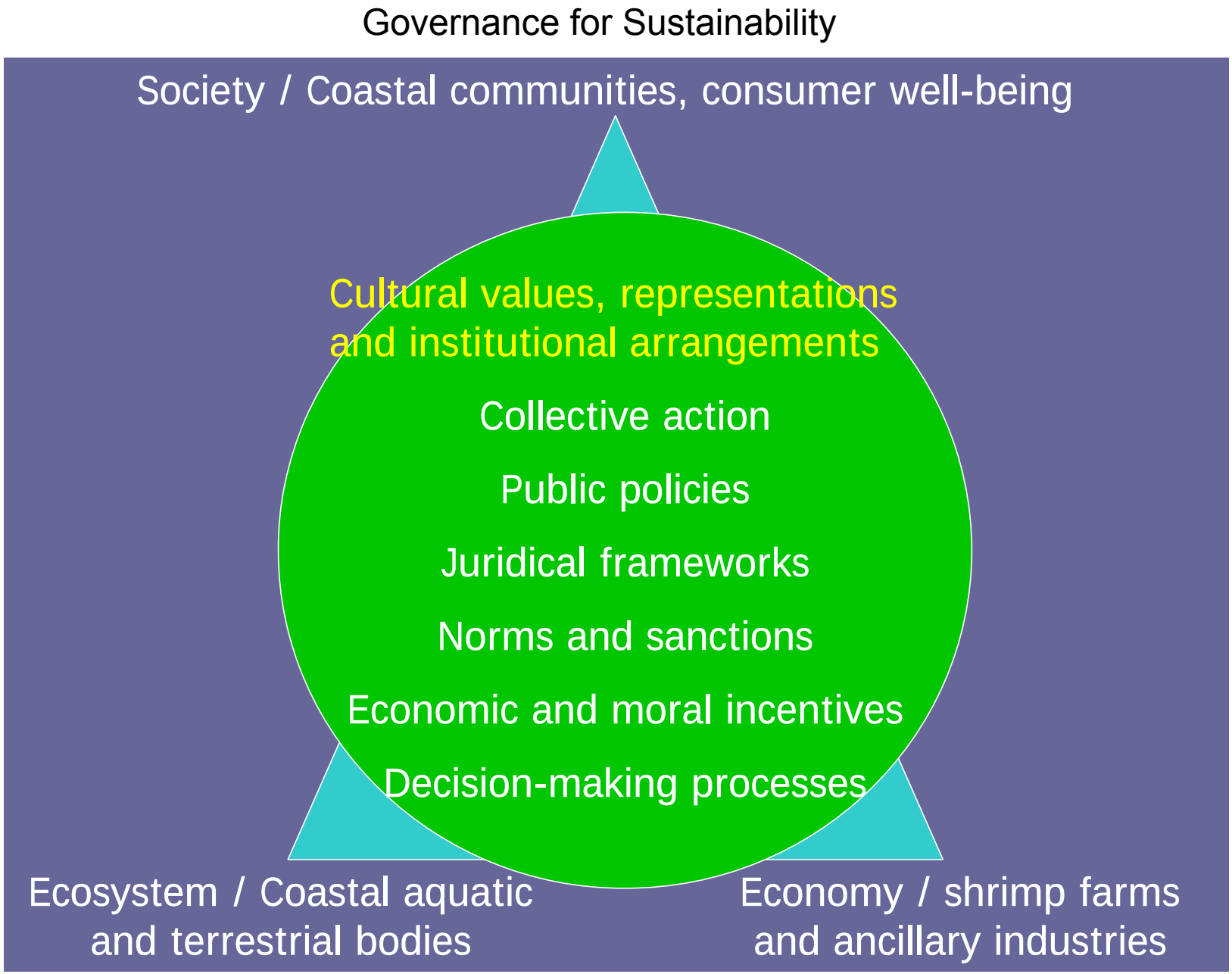
Discussion over sustainability issues

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



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)

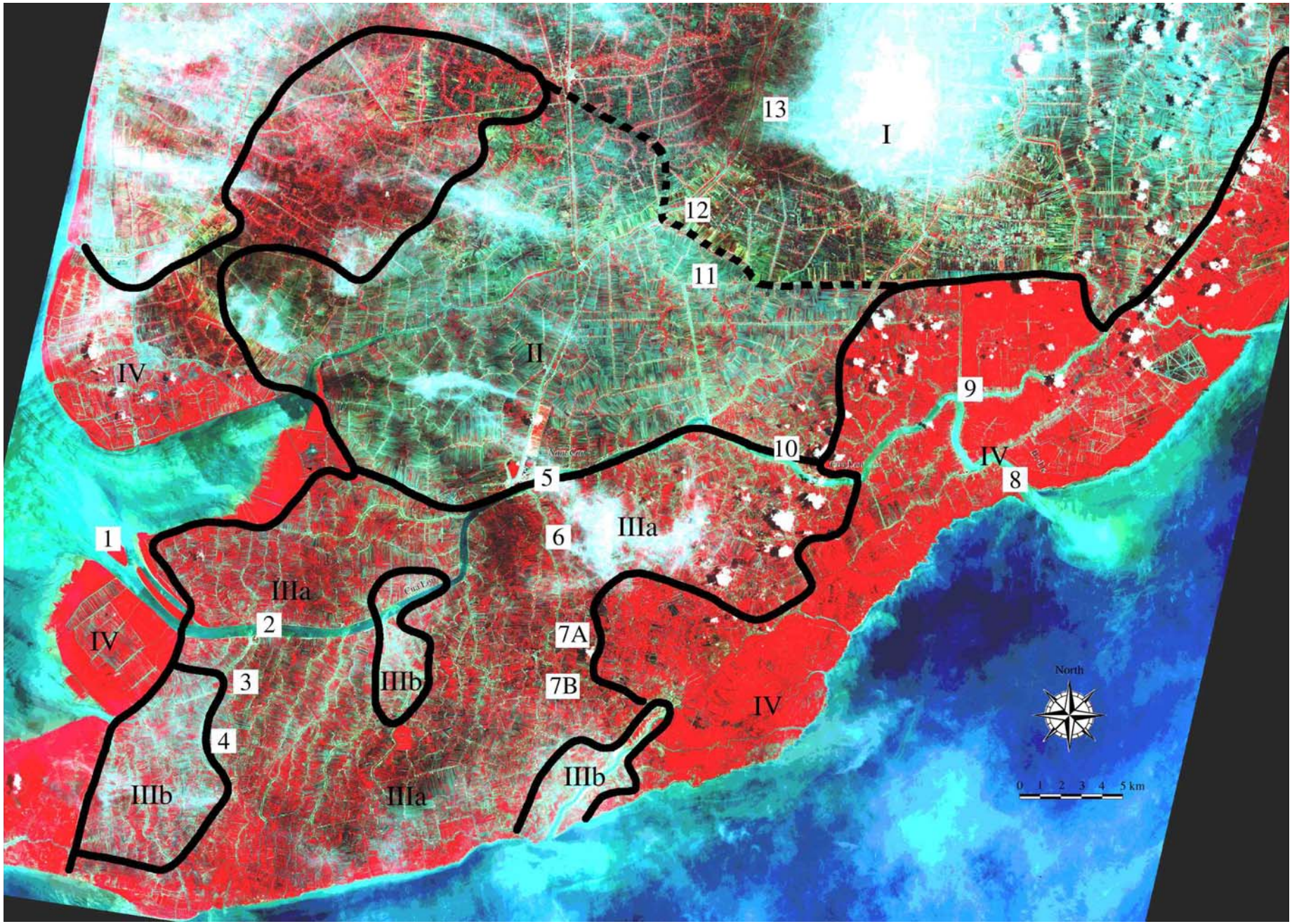
- Try to assess the real impact of SF development over a province or a district; even roughly through regional economic tool (regional accounting and greening the accounting in a second step) assessing first direct an indirect effects of SF in terms of market values (what really remains over the exploited 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.

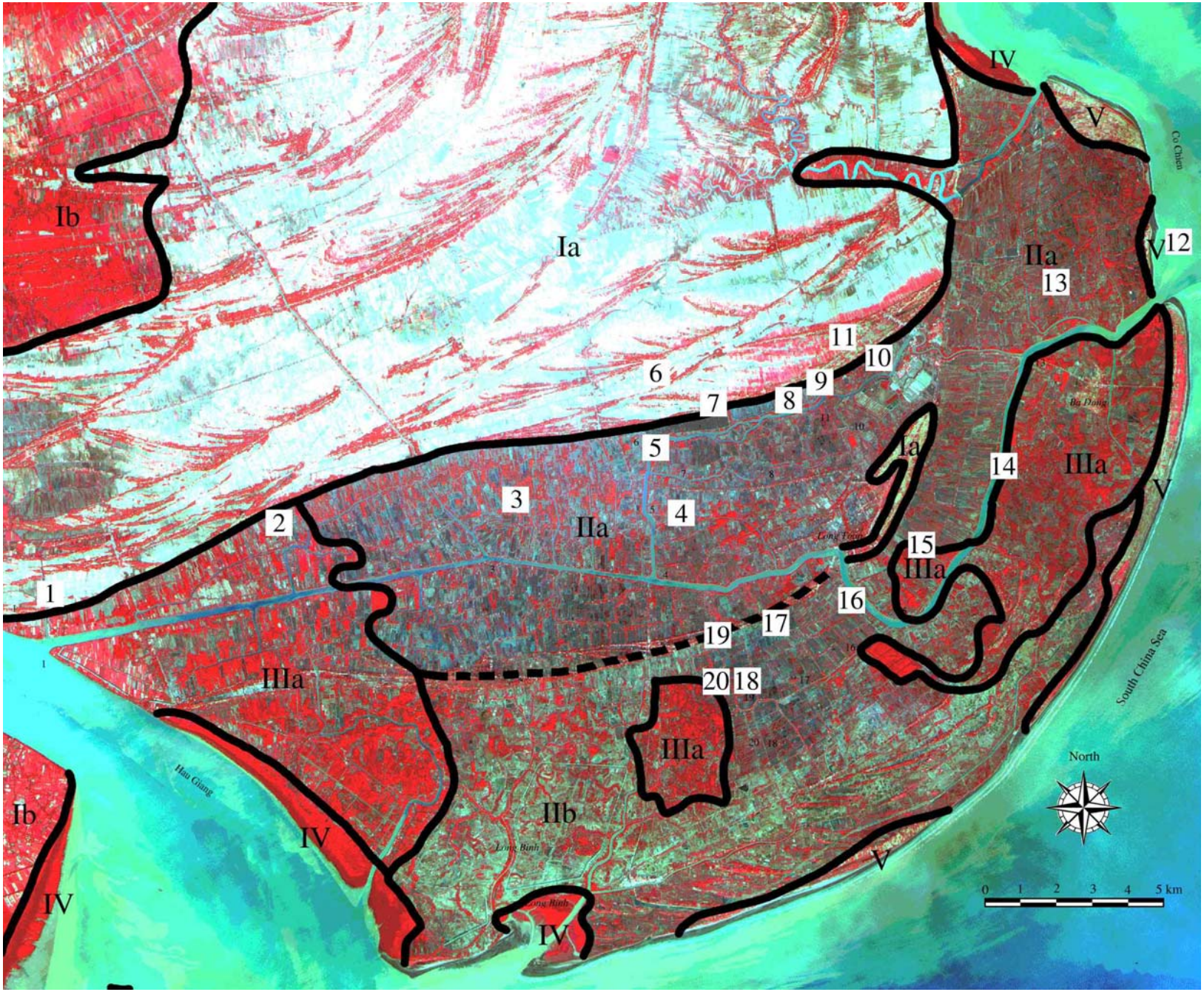
Public policy can be defined as all forms of cooperative / collective actions that intend to constrain or orientate individual choices. The challenges of public policy are crucial for the sustainability of shrimp farming that cannot be constrained by only environmental or economic sustainability.

Cám ơn nhiều!

Thank You!



Ca Mau, Colour composite SPOT 4, 2001-04-10



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