Aquaculture in Vietnam
– tradition and innovation;
do not be afraid of pangasius catfish
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Introduction

- The process of aquaculture development in Vietnam has gone through several different stages.

- Currently, aquaculture sector is playing a significant role to the economy of Vietnam: supplying about 40% of animal protein in Vietnamese food; providing nearly 4.5 million jobs; approaching 4.2% of GDP.

In 2015

- Total fisheries production reached to 6.56 million tonnes

- Fisheries export value was up to $6.72 billions

* exporting to over 170 countries and territories
Introduction

* Aquaculture area increased from 230 thousand ha in 1981 to 1.28 million ha in 2015

* There are approximately 500 species of freshwater fisheries and almost 200 species of brackish water and saltwater has been cultured. Catfish and shrimps are the two main groups of aquaculture in Vietnam to meet the export targets.
Potential area for aquaculture

Freshwater:
- Ponds and small lakes: 120,000 ha
- Medium and larger Reservoirs: 340,000 ha
- Rice-fields: 580,000 ha

Marine & Brackish Water:
- Tidal areas: 600,000 ha
- Lagoons suitable for aquaculture: 300-400,000 ha
Aquatic Species Biodiversity

- 2,030 species of endemic fish
- 1,600 species of endemic crustaceans
- 2,500 species of endemic shellfish
- Many seaweed species
- 165 species of commercial importance
  (71 fresh water, 49 brackish water, 45 marine)

Major export species:

- Capture: tuna, makeral, sardin and some others
Potential and situation of aquaculture in Vietnam

Fisheries production of VN from 1980 to 2015

- For last 10 years: total fisheries production has increased approximately 2.03 times
- Fisheries export value has increased approximately 12.2 times from 1995 to 2015.
# Farmed food fish production by top 10 producers and main groups of farmed species in 2012
(Source: The State of World Fisheries and Aquaculture 2014, FAO)

<table>
<thead>
<tr>
<th>Producer</th>
<th>Finfish</th>
<th></th>
<th></th>
<th></th>
<th>Other species</th>
<th>National Total</th>
<th>Share in world total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inland Aquaculture</td>
<td>Mariculture</td>
<td>Crusstaceans</td>
<td>Moluscs</td>
<td></td>
<td></td>
<td>Percentage</td>
</tr>
<tr>
<td>China</td>
<td>23 341 134</td>
<td>1 028 399</td>
<td>3 592 588</td>
<td>12 343</td>
<td>803</td>
<td>41 108</td>
<td>61.7</td>
</tr>
<tr>
<td>India</td>
<td>3 812 420</td>
<td>84 164</td>
<td>299 926</td>
<td>12 905</td>
<td></td>
<td>4 209 415</td>
<td>6.3</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>2 091 200</td>
<td>51 000</td>
<td>513 100</td>
<td>400 000</td>
<td>30 200</td>
<td>3 085 500</td>
<td>4.6</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2 097 407</td>
<td>582 077</td>
<td>387 698</td>
<td></td>
<td>477</td>
<td>3 067 660</td>
<td>4.6</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>1 525 672</td>
<td>63 220</td>
<td>137 174</td>
<td></td>
<td></td>
<td>1 726 066</td>
<td>2.6</td>
</tr>
<tr>
<td>Norway</td>
<td>85</td>
<td>1 319 033</td>
<td></td>
<td>2 001</td>
<td></td>
<td>1 321 119</td>
<td>2</td>
</tr>
<tr>
<td>Thailand</td>
<td>380 986</td>
<td>19 994</td>
<td>623 660</td>
<td>205 192</td>
<td>4 045</td>
<td>1 233 877</td>
<td>1.9</td>
</tr>
<tr>
<td>Chile</td>
<td>59 527</td>
<td>758 587</td>
<td></td>
<td>253 307</td>
<td></td>
<td>1 071 421</td>
<td>1.6</td>
</tr>
<tr>
<td>Egypt</td>
<td>1 016 629</td>
<td></td>
<td>1 109</td>
<td></td>
<td></td>
<td>1 017 738</td>
<td>1.5</td>
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<tr>
<td>Myanmar</td>
<td>822 589</td>
<td>1 868</td>
<td>58 981</td>
<td></td>
<td>1 731</td>
<td>885 169</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Note: The symbol “…” means the production data are not available or the production volume is regarded as negligibly low.
**Top ten exporters of fish and fishery products in 2012**
(Source: The State of World Fisheries and Aquaculture 2014, FAO)

<table>
<thead>
<tr>
<th>EXPORTERS</th>
<th>2002 (US$ millions)</th>
<th>2012 (US$ millions)</th>
<th>APR (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>4 485</td>
<td>18 228</td>
<td>15.1</td>
</tr>
<tr>
<td>Norway</td>
<td>3 569</td>
<td>8 912</td>
<td>9.6</td>
</tr>
<tr>
<td>Thailand</td>
<td>3 698</td>
<td>8 079</td>
<td>8.1</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>2 037</td>
<td>6 278</td>
<td>11.9</td>
</tr>
<tr>
<td>United States of America</td>
<td>3 260</td>
<td>5 753</td>
<td>5.8</td>
</tr>
<tr>
<td>Chile</td>
<td>1 867</td>
<td>4 386</td>
<td>8.9</td>
</tr>
<tr>
<td>Canada</td>
<td>3 044</td>
<td>4 213</td>
<td>3.3</td>
</tr>
<tr>
<td>Denmark</td>
<td>2 872</td>
<td>4 139</td>
<td>3.7</td>
</tr>
<tr>
<td>Spain</td>
<td>1 889</td>
<td>3 927</td>
<td>7.6</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1 803</td>
<td>3 874</td>
<td>7.9</td>
</tr>
<tr>
<td><strong>TOP TEN SUBTOTAL</strong></td>
<td><strong>28 525</strong></td>
<td><strong>67 788</strong></td>
<td><strong>9.0</strong></td>
</tr>
<tr>
<td><strong>REST OF WORLD TOTAL</strong></td>
<td><strong>29 776</strong></td>
<td><strong>61 319</strong></td>
<td><strong>7.5</strong></td>
</tr>
<tr>
<td><strong>WORLD TOTAL</strong></td>
<td><strong>58 301</strong></td>
<td><strong>129 107</strong></td>
<td><strong>8.3</strong></td>
</tr>
</tbody>
</table>

- Fisheries export value of VN has increased to $6.72 billions in 2015
The stages of aquaculture development in Vietnam

Process of aquaculture development in Vietnam can be divided into 3 periods:

1) Aquaculture development before 1960
   - had considered as the natural economic activities with backward and handmade production level to meet the needs of subsistence of people; as a secondary job in agricultural production.
   - Traditional extensive farming, improved extensive, and low semi-intensive farming in freshwater and brackish water
The stages of aquaculture development in Vietnam

2) Aquaculture development in the period of 1960 -1980
   - impacted by the American war
   - developed towards self-sufficiency with the typical model called "Uncle Ho fish pond"
   - established the General Directorate of Fisheries in 1960.
   - established the Ministry of Marine Fisheries in 1976.

Almost families had had an “Uncle Ho fish pond”
The stages of aquaculture development in Vietnam

3) Aquaculture development from 1981 to now on
3.1) The period of 1981 - 1993
- Fisheries sector entered the stage of comprehensive development of the exploitation, farming, logistics services, processing,…

- 1986: Communist Party of Vietnam decided to apply the policy of Doi Moi (the Renovation), converted from "the collective economy" to "the multi-sector commodity economy“; the shift to market mechanism with socialist orientation

- Aquaculture had been regarded as a pioneering sector in the renewal process and international integration.
3) Aquaculture development from 1981 to now on
3.1) The period of 1981 - 1993
- The forms of improved extensive, and semi-intensive farming
- had not really paid much attention to the issue of food safety
- Many forms of integrated aquaculture (fish - duck, fish - pigs, ...), fish rearing in Waste water reservoir,..., had developed widely
The stages of aquaculture development in Vietnam

3) Aquaculture development from 1986 to now on
3.2) The stage from 1993 to now on

- From 1993, Communist Party of Vietnam has been identified Aquaculture as a key economic sector of Vietnam

- characterized by the commodity production to meet the export-oriented

- Focus on innovation of management methods of quality and product safety, then approach to meet the highest demands of the world's major markets.
The stages of aquaculture development in Vietnam

3) Aquaculture development from 1986 to now on

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To promote the application of advanced science and technology in production

- The development of food processing industry and the expansion of international trade are the push for the development of aquaculture in Vietnam
The stages of aquaculture development in Vietnam

3) Aquaculture development from 1986 to now on

3.2) The stage from 1993 to now on

The forms of aquaculture:

- Developing all aquaculture levels evenly: Ecological, semi-industrial, industrial aquaculture (super-intensive, intensive, semi-intensive, extensive models)
- including the types of monoculture, polyculture and integrated farming in freshwater, brackish water and saltwater
- static water, flowing water or recirculating aquaculture
The stages of aquaculture development in Vietnam

3) Aquaculture development from 1986 to now on

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- Developing all aquaculture levels evenly: Ecological, semi-industrial, industrial aquaculture (super-intensive, intensive, semi-intensive, extensive models)
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The stages of aquaculture development in Vietnam

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The stages of aquaculture development in Vietnam
The stages of aquaculture development in Vietnam

3) Aquaculture development from 1986 to now on

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The forms of aquaculture:

- Recently years, promoting to apply the forms of aquaculture are responsible for, such as:
  + GAP (Good Aquaculture Practices)
  + BMPs (Better Management Practices)
  + Organic culture,
  + Aquaculture Environmental friendly
  + Aquaculture Biosecurity
  + Responsible farming
Breed production 2014:

- 2305 shrimp hatcheries where produced about 100 billion pieces of white leg shrimp breeds and 30 billion pieces of black tiger shrimp breeds;
- 230 catfish hatcheries where produced over 2 billion pieces of Tra fish breeds; and
- 236 tilapia hatcheries produced about 455 million pieces of tilapia breeds.
- Other hatcheries

*We have met almost of breed demand for aquaculture in our country.*
The species of aquaculture in Vietnam

1. Freshwater aquaculture

Tilapia

*For example:*

Unisexual tilapia culture:
- Stocking density: 3-4 / m²
- Culture period: 5 months
- The harvest weight: 0.8-1 kg/fish
- Yield: 13-18 tons/ha.

Nile Tilapia (*Oreochromis niloticus*)

Blue Tilapia (*O. Aureus*), Red Tilapia (*Oreochromis sp*)
1. Freshwater aquaculture

- Scaly carp
- Red carp
- Grass carp
- The common carp (*Cyprinus carpio*)
- Bighead carp
- Silver carp
- The black carp (*Mylopharyngodon piceus*)
1. Freshwater aquaculture

Catla carp

Indian carp

Mud carp

Mrigal Carp

Labeo rohita
1. Freshwater aquaculture

- Anabas (Anabas testudineus)
- Asian River Catfish (Hemibagrus nemurus)
- Bighead catfish (Clarias macrocephalus)
- Snackhead fish
- Channa (Channa striatus)
Rainbow trout (Oncorhynchus mykiss)

Sturgeon (Acipenser sturio)

The fish species imported from Cold-water

Giant mottled eel (Anguilla marmorata)

Goby (Oxyeleotris marmorata)

Giant river prawn
Macrobrachium rosenbergii

Rainbow trout (Oncorhynchus mykiss)
1. Freshwater aquaculture

Ornamental fishes

- Small scale

- In Ho Chi Minh City: 300 farms of ornamental fish, providing for the European market, American and some Asian countries, about 60 species.
- To 2013: Exports reached about $6 millions.
1. Freshwater aquaculture

Special aquatic culture

Frog

tortoise
2. Brackish water aquaculture

- Ponds, integrated farming (Mangrove – fish, shrimp), ...
- Monoculture or polyculture
- Extensive, semi-intensive and intensive
- flowing or recirculating aquaculture
The species of aquaculture in Vietnam

2. Brackish water aquaculture

- Brackish water shrimp farming area: 685 thousand hectares, up 4.4% compared with 2013, including white shrimp reached 400 thousand ha and 260 thousand ha of black tiger shrimp.
- Production: 660 thousand tons, up more than 20% compared with 2013;
- Exports worth: $ 3.8 billion, up 27% compared to 2013.
The species of aquaculture in Vietnam

2. Brackish water aquaculture

Four-eared sleeper (Bostrychus sinensis)  Red drum (Sciaenops ocellatus)

mud crabs
Blue crabs
Sea bass (Lates calcarifer)
2. Brackish water aquaculture

Sea weeds

Cottonii (*Kappaphycus alvarezii*)

*Gracilaria verrucosa*
The species of aquaculture in Vietnam

3. Marine aquaculture
- Ponds, cages,…
- Monoculture or polyculture
- Semi-intensive and intensive
- Flowing water, recirculating aquaculture, open aquaculture
The species of aquaculture in Vietnam

3. Marine aquaculture

* Lobster culture in sea cages
  - Floating cages - (A)
  - Pinned opened cages - (B)
  - Sinking cages - (C)
3. Marine aquaculture

Pearl culture

Pteria penguin

P. martensii

P. maxima
3. Marine aquaculture

- Clams (*Meretrix meretrix*)
- Abalone (*Haliotis asinina*)
- Oyster (*C.rivularis*)
- Blue mussel (*Perna viridis*)
- Geo-Duck (*Lutraria philippinarum*)
- seahorses
Holothurian

Hatchery of snail

King crab hatchery
Plankton as feed for aquatic animals

Artemia

Rotifer

Copepods

Isochrysis sp.
The stories about Pangasius catfish of Vietnam

**Basa fish**
(Pangasius bocourti)

**Tra fish**
(Pangasius hypophthalmus)

**Fishery production of VN in 2015 (1000 tons)**
- Tra & Basa production: 1220
- Shrimp production: 596
- The others: 4744

**Exported value of Fishery of VN in 2015**
- Exported Tra & Basa value: 2120
- Exported shrimp value: 1600
- The others: 3000
The stories about Pangasius catfish of Vietnam

* Pangasius have been raising and developing mostly in 10 Mekong Delta River provinces of Vietnam

* Pangasius products are produced in compliance with strict international food safety and international quality management standards such as Global GAP, ASC and BAP.
The stories about Pangasius catfish of Vietnam

* Catfish farming area in 2015: 5623 hectares and expected to rise up to 7,600 – 7,800 hectares in 2020.

* There are nearly 100 pangasius factories in Vietnam now.

* The fish has been exported to over 160 countries and territories, including demanding markets as the EU, Brazil, USA, Australia and Canada,… thanks to the prestige, quality and competitive prices
The stories about Pangasius catfish of Vietnam

1- High productivity
   - Stocking density: 60 fish/ m2
   - Pond depth: 3 - 3.5m
   - Culture period: 10 months
   - Yield: 280 tons /ha/crops
* Even: 500 -600 tons/ha/year
   - 120 fish/m2
   - 5-6m depth

Basa fish is now more popular than Tra fish
   - higher density rearing
   - Good resistance
   - suit for the predilection of consumers
The stories about Pangasius catfish of Vietnam

2- The famous lawsuit with the US

-Several papers in the US wrote that the forms of catfish culture in Vietnam were not hygienic. Some US senators went to Vietnam to check it then they knew that's story was in the past only.
- Currently, the forms of industrial & semi-industrial aquaculture have developed to serve export purpose
The stories about Pangasius catfish of Vietnam

2- The famous lawsuit with the US

- After the Catfish trademark lawsuit in 2001, pangasius products of Vietnam export to American market called:
  + Tra, Swai, Sutchi catfish, Striped catfish, Silver striped catfish for *Pangasianodon hypophthalmus*,
  + Basa, basa fish, bocourti, Bocourti fish, Bocourti catfish for *Pangasius bocourti*

- After the dumping lawsuit of pangasius in 2003 with The US, Vietnamese companies have taxed in range of 31.45% - 63.88% when they export to the US market.
The stories about Pangasius catfish of Vietnam

2- The famous lawsuit with the US

- Agriculture Act of 2014 of the United States brought Pangasius fish of Vietnam into the program of their inspection and monitoring.

- On May 25, 2016, the US Senate adopted the draft resolution No. 28 to abolish this program.

- We believe that the US House of Representatives and President Obama will soon adopt this bill, before we formally engage in Trans-Pacific Partnership Agreement (TPP).

- It's a win for both sides, the Vietnam exporters and the consumers in the US.
References

- http://www.fao.org/3/d1eaa9a1-5a71-4e42-86c0-f2111f07de16/i3720e.pdf....
Thank you for your attention!