

# SYSTEMS AND SPECIES IN WORLDWIDE SHRIMP FARMING

EuroShrimp 2017



Engineering and Consultancy Office  
Specialised in **Aquaculture**

[www.ideeaquaculture.com](http://www.ideeaquaculture.com)

# Summary

1. General Data on world shrimp farming production
2. Different species
3. Different types of production
4. Future of shrimp farming in Europe

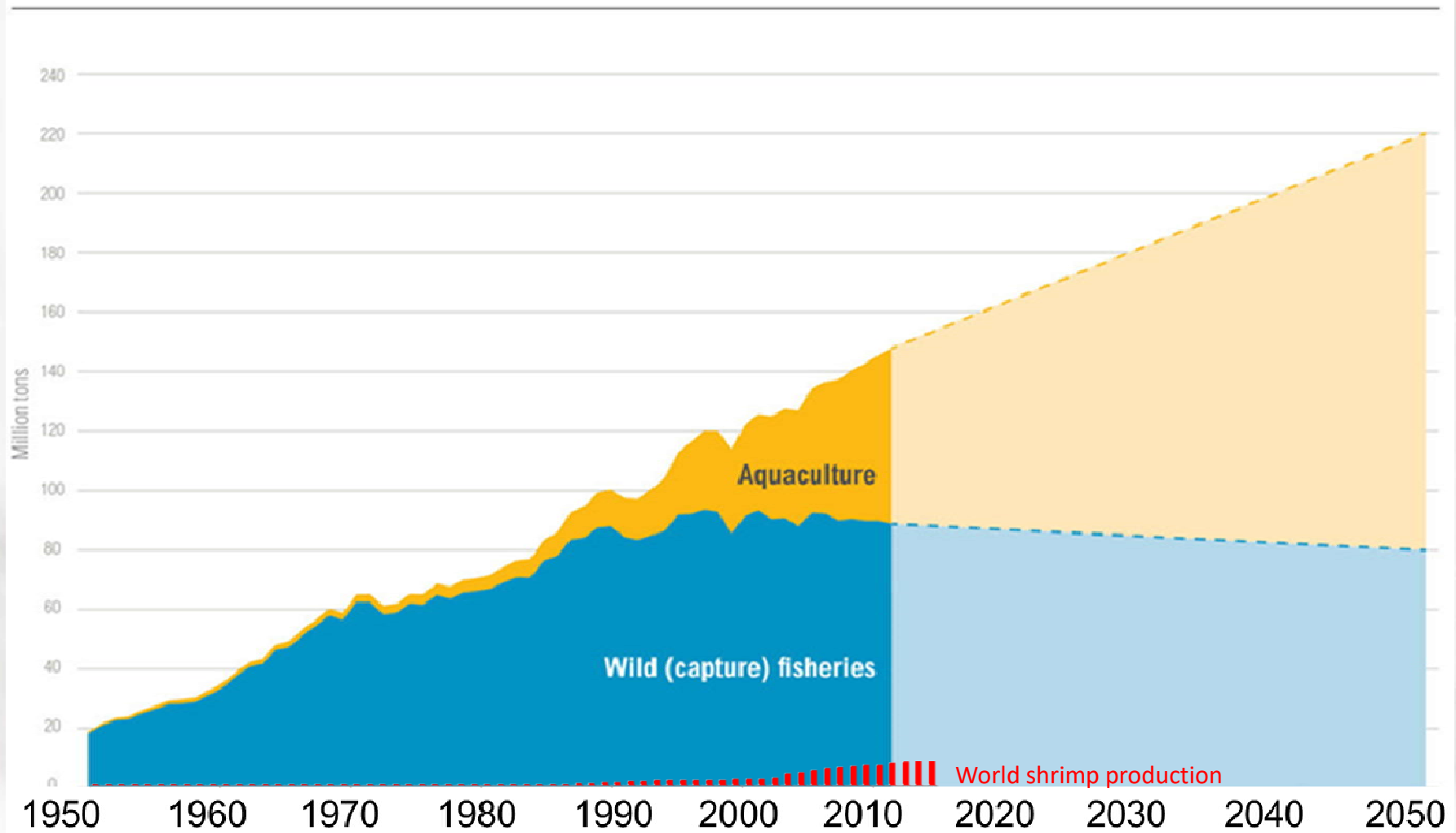


1.

# General Data on world shrimp farming

# World aquaculture & fisheries context

## Aquaculture Is Expanding to Meet World Fish Demand

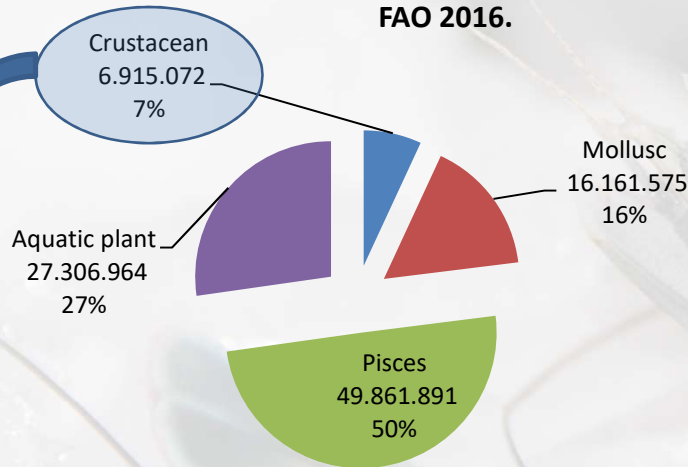


Source: Historical data 1950–2010: FAO. 2014. "FishStatJ." Rome: FAO. Projections 2011–2050: Calculated at WRI, assumes 10 percent reduction in wild fish catch between 2010 and 2050, and linear growth of aquaculture production at an additional 2 million tons per year between 2010 and 2050.

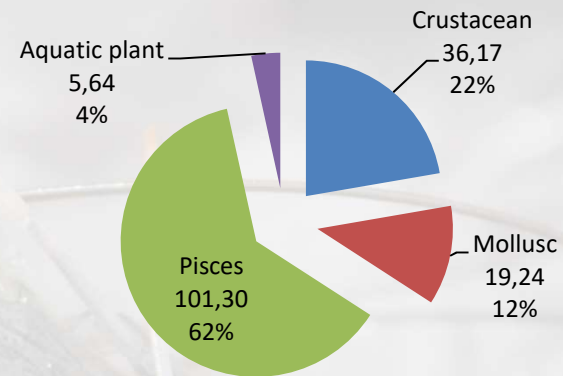


# Aquaculture Market Share (weight and value)

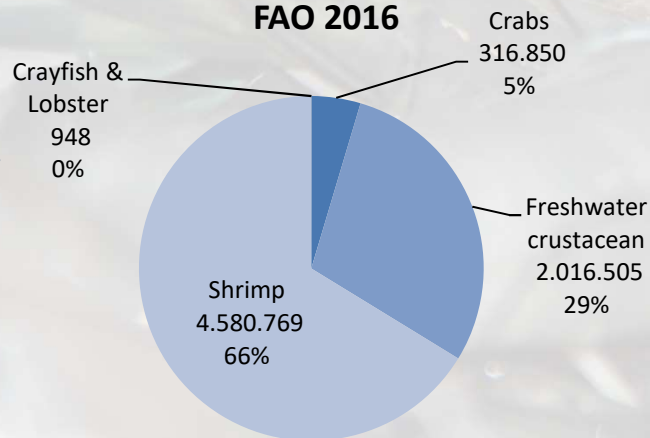
**Production in 2014: quantity (tons),  
FAO 2016.**



**Production in 2014: value (Billion \$),  
FAO 2016.**



**Crustacean Market share (tons in 2014),  
FAO 2016**

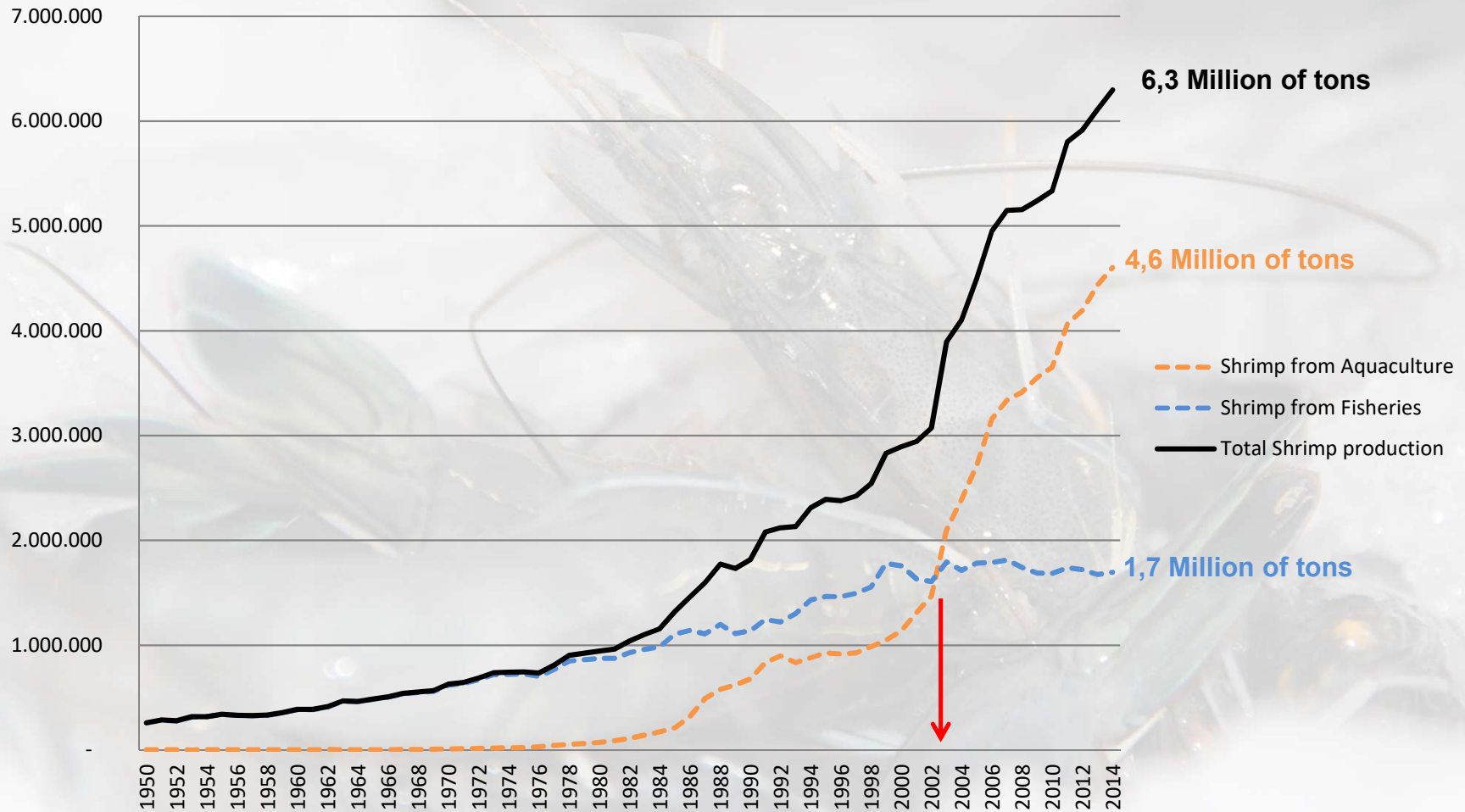


# Aquaculture vs Fisheries

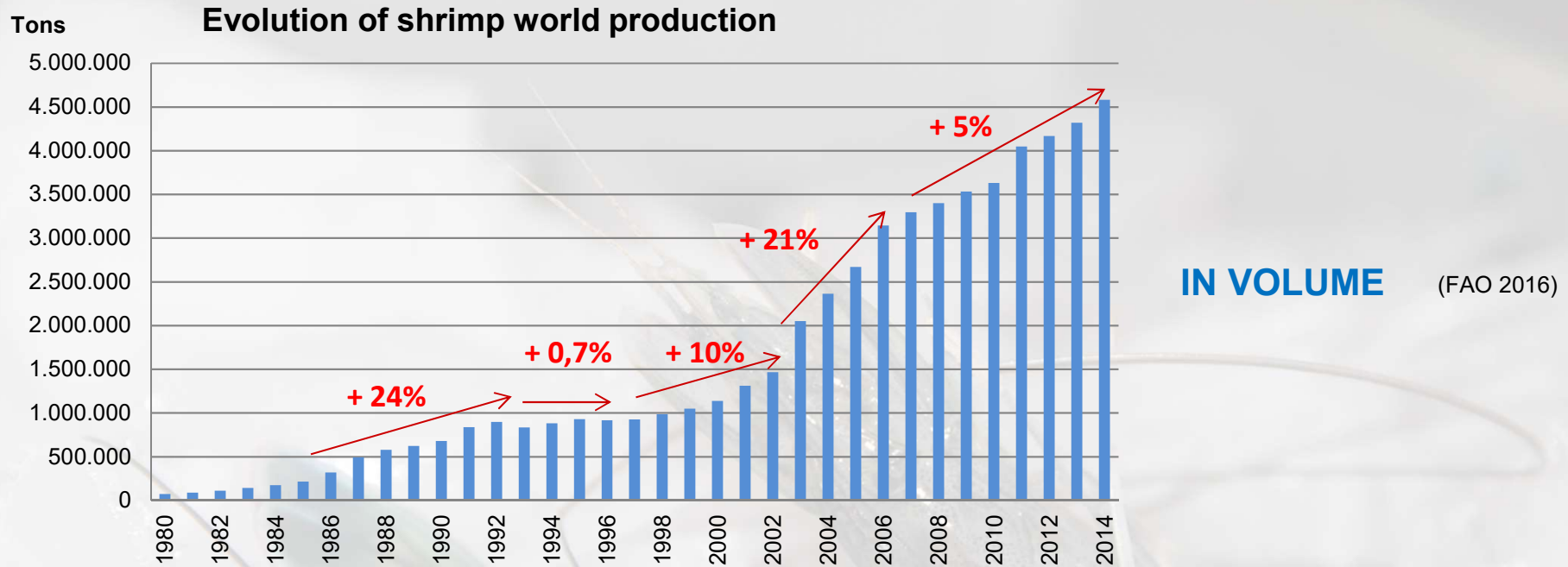
## World shrimp production: aquaculture vs capture

Source: FAO 2016

Tons

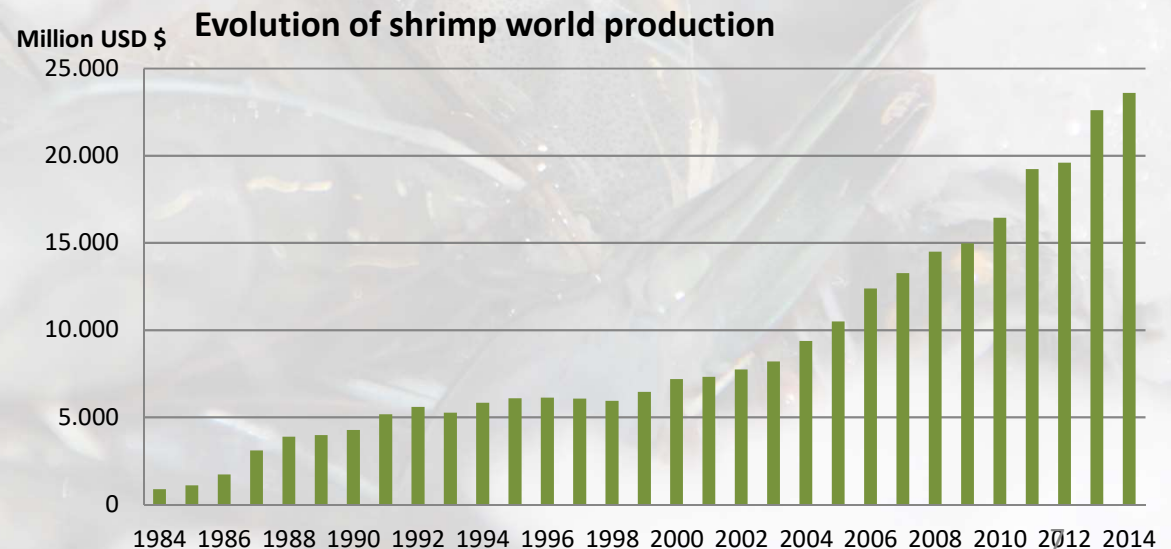


# World production of Shrimps (Aquaculture only)



(FAO 2016) **IN VALUE**

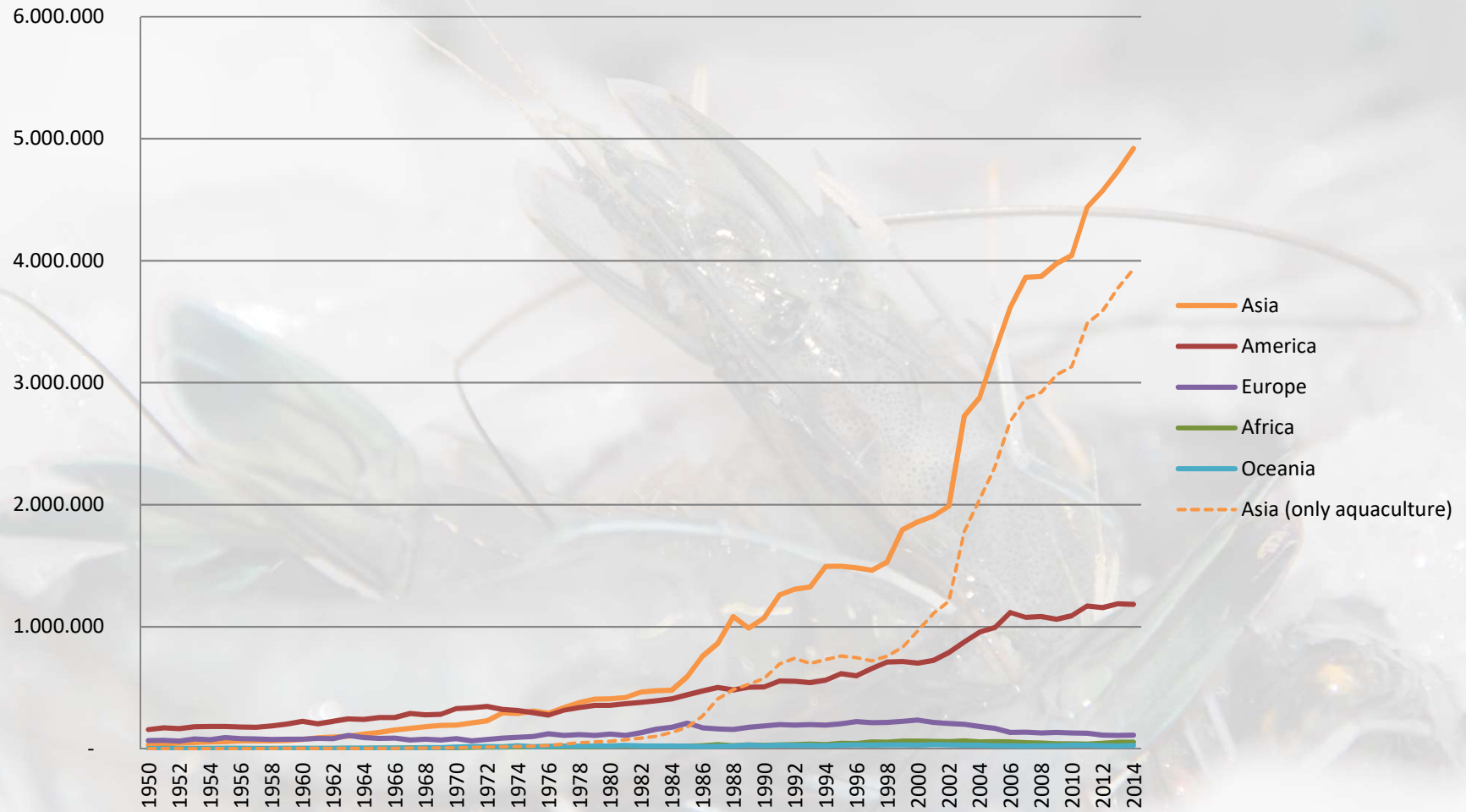
**In 2014:**  
**4,6 Million of tons – 23,6 Billion \$**  
 → **4,76 €/kg ex-farm on average**  
 → **≈ 12 €/kg retail price**



# World shrimp production (aquaculture & capture) by continents,

Source: FAO 2016

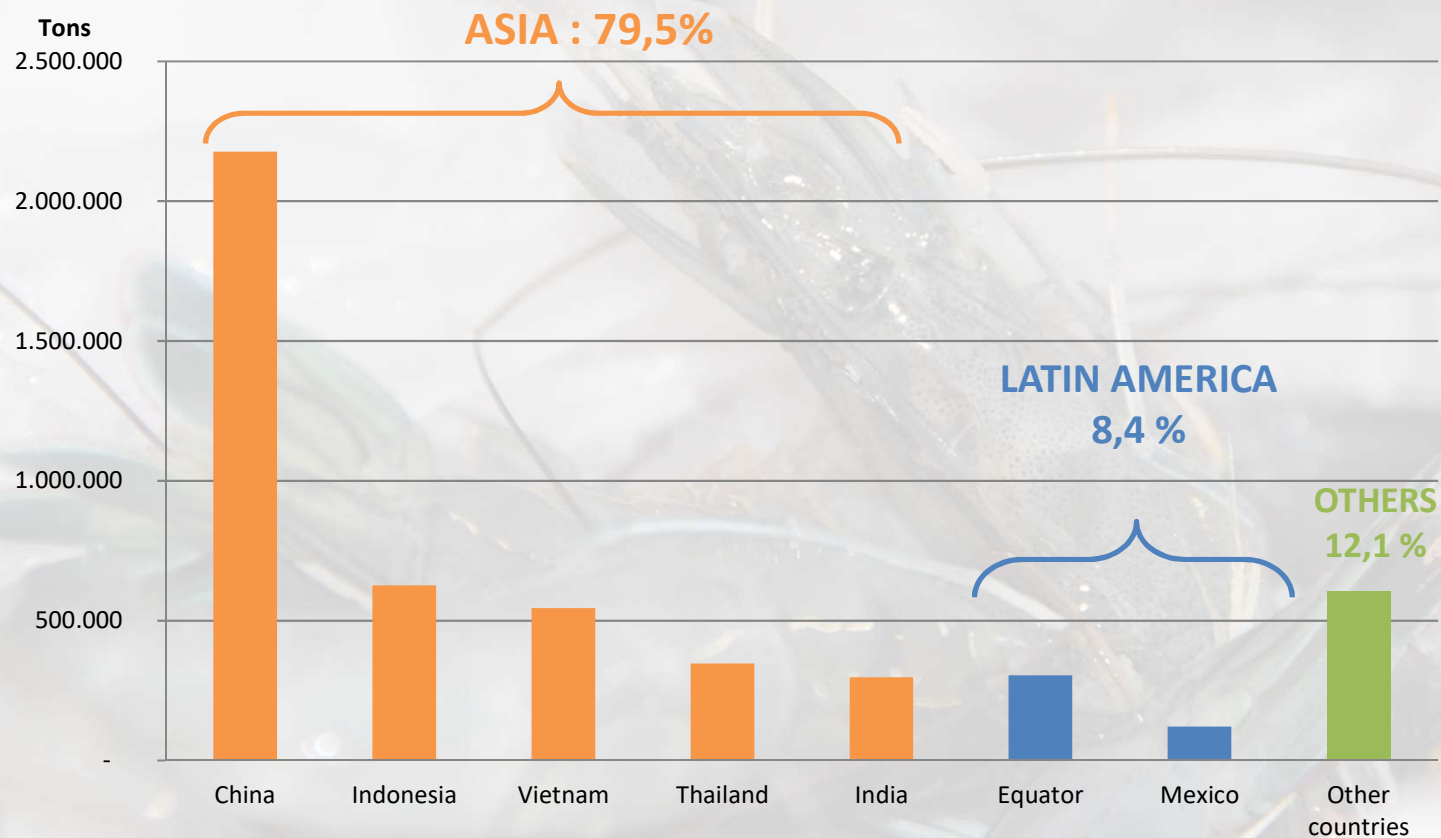
Tons





# Main shrimp producers (aquaculture)

Main shrimp producer countries, FAO 2016





South coast of China ( 2016)



China: near Zhanjiang city, industrial harbor and shrimp farming (2016)



Indonesia: south of Jakarta (2015)



Semi- intensive farm in Equator (2013)



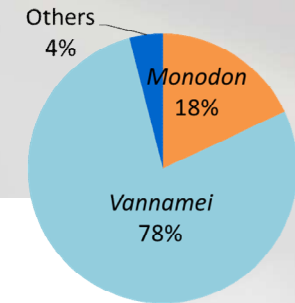
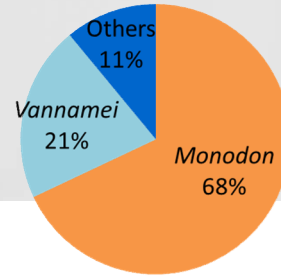
India; artisanal farm (2004)



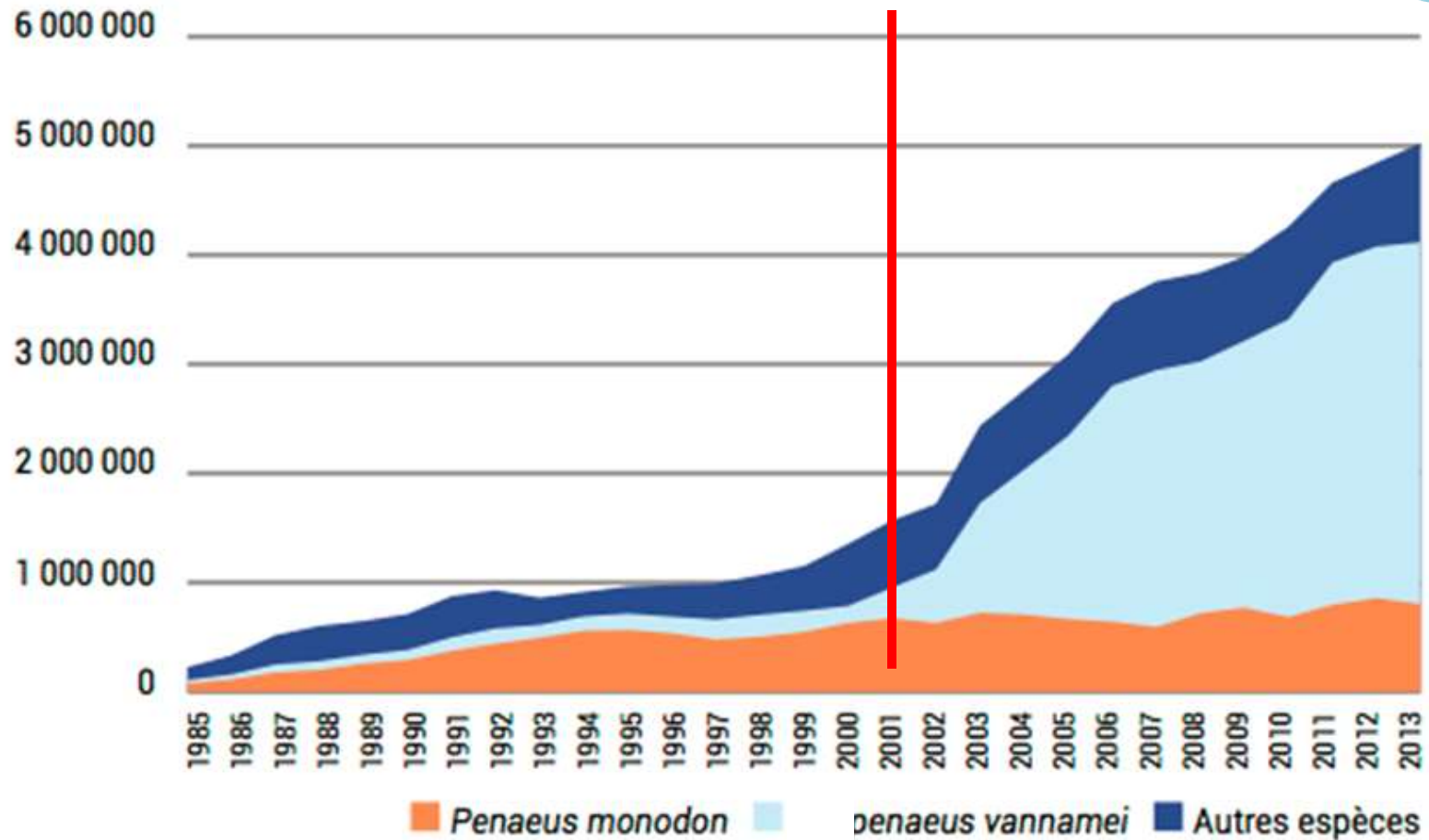
2.

## Different species

# World shrimp production from aquaculture (tons)

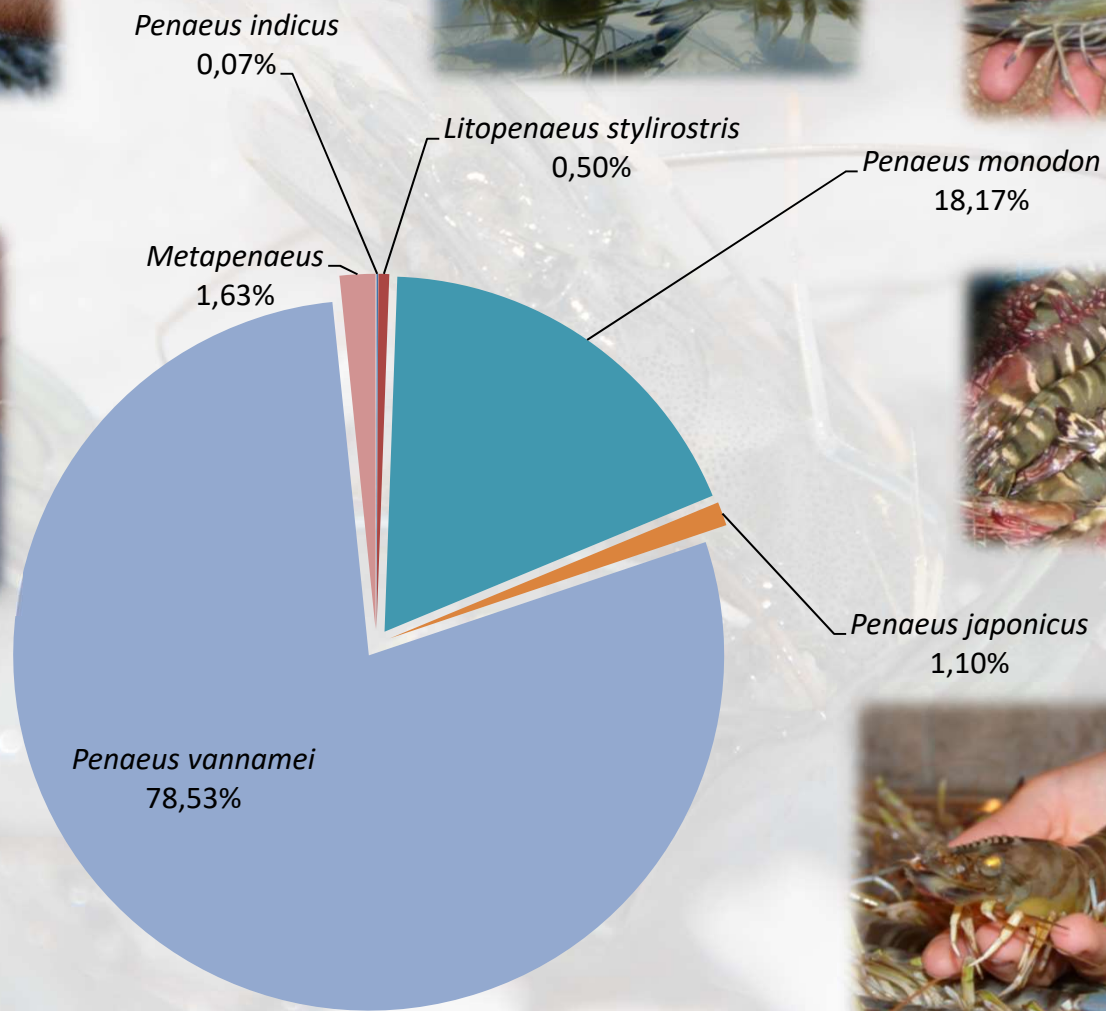


Source FAO 2016





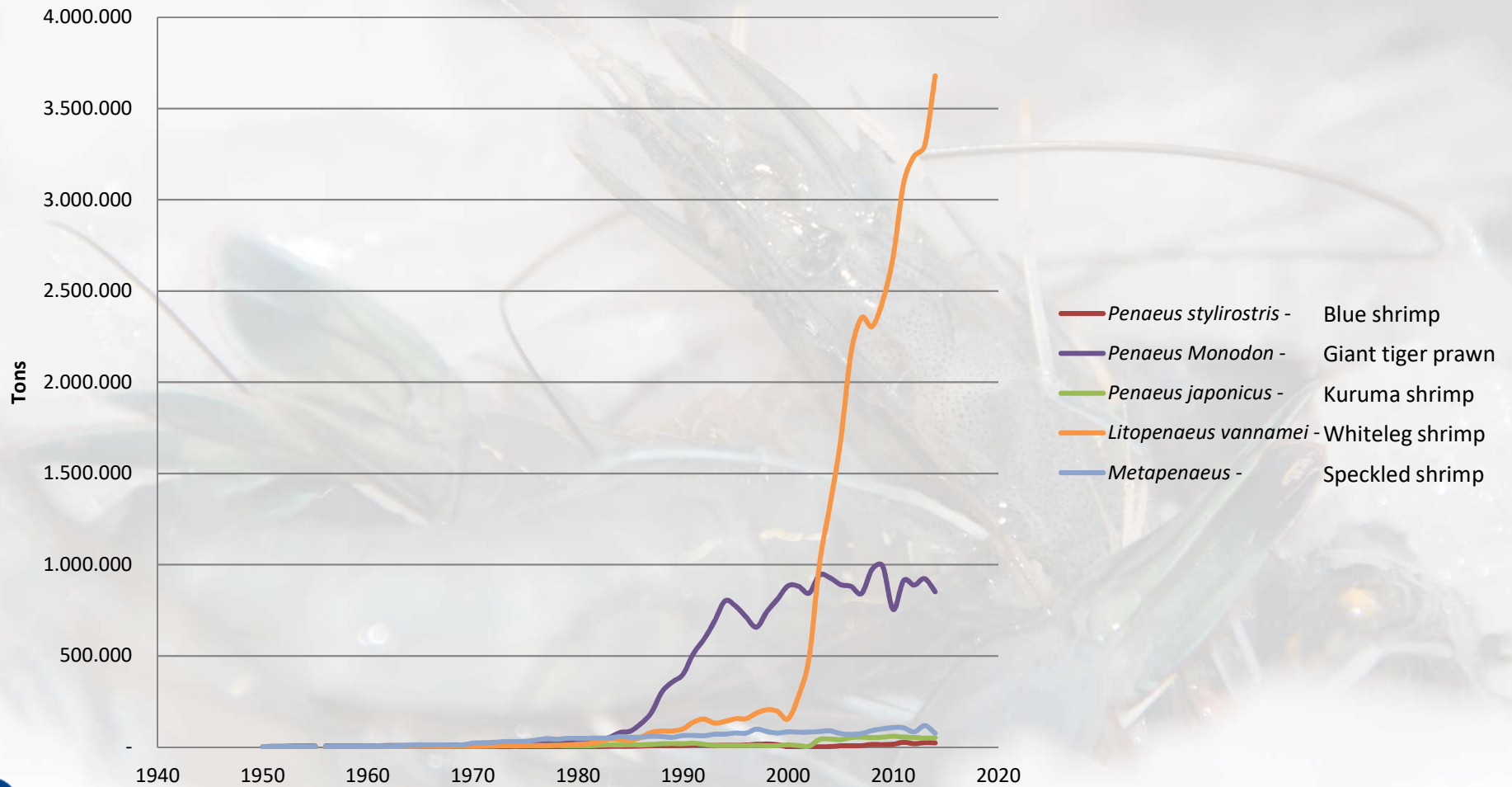
# World shrimp production by species in 2014, Source FAO 2016



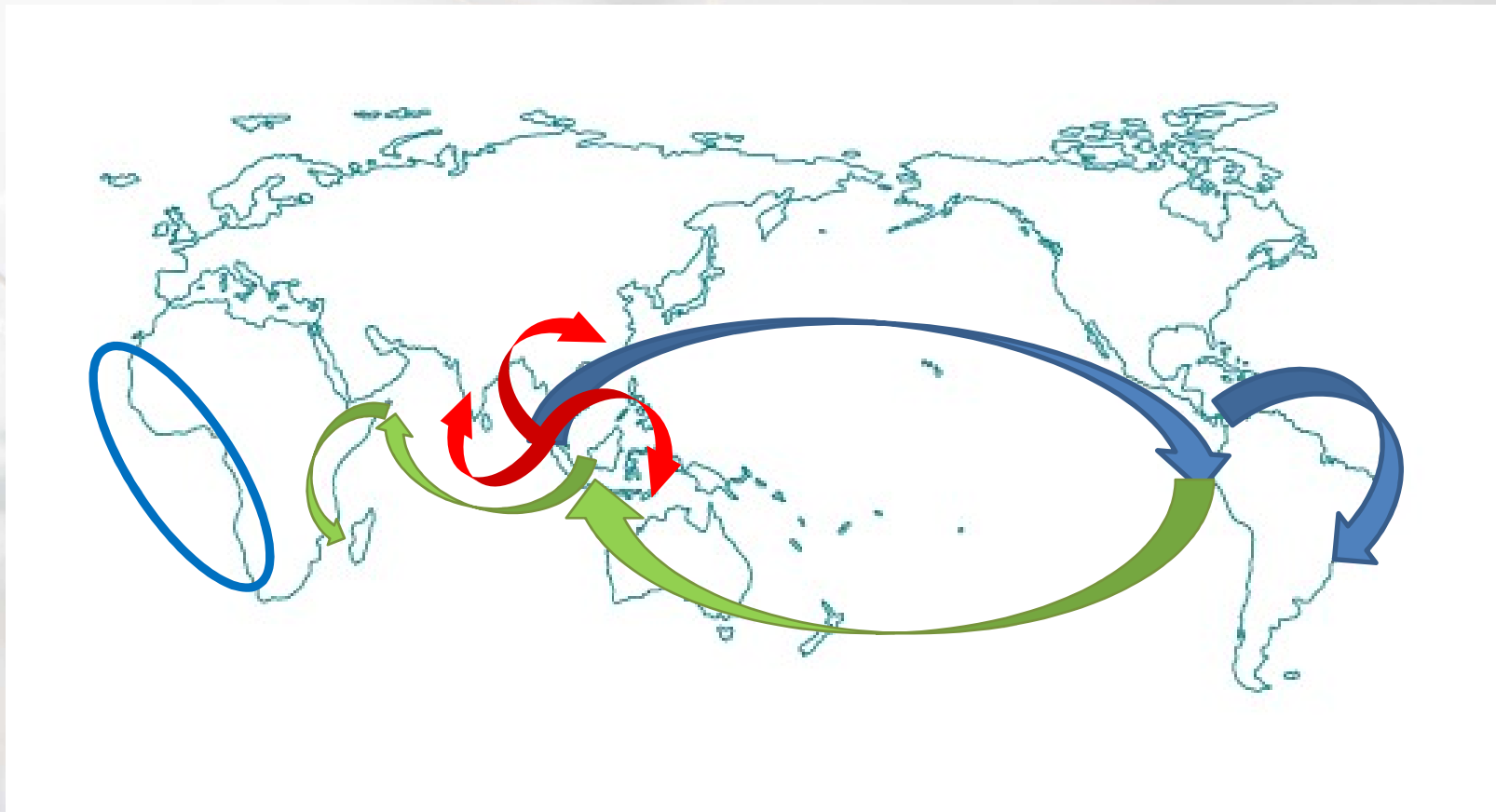
2 varieties of *P. monodon*

# World shrimp production (aquaculture) by species from 1950 to 2014

Source FAO 2016



**White spot: only one tropical zone without neither production nor diseases**



A close-up photograph of a large, translucent shrimp resting on a bed of white ice. The shrimp's body is detailed, showing its legs and antennae. The background is slightly blurred, emphasizing the shrimp.

**3.**

## **Different types of production**

# Different types of production

<i>Type</i>	<i>Productivity</i>	<i>Development models</i>	<i>Characteristic ponds</i>
<u>EXTENSIVE</u>	50 to 300 kg/ha/year	Traditional	From 1 000 m <sup>2</sup> to few ha Tide water supply Natural productivity
<u>SEMI INTENSIVE LIGHT</u>	0,8 to 2 t/ha/year	Artisanal or pre-industrial	Pumped water supply or tide water supply Natural productivity and artificial food
<u>SEMI-INTENSIVE</u>	2 to 5 t/ha/year	Pre-industrial or industrial	5 to 10 ha. Pumped water supply Artificial food
<u>HEAVY SEMI INTENSIVE</u>	6 to 8 t/ha/year	Industrial	0,5 to 3 ha Pumped water supply Artificial food Light aeration system
<u>INTENSIVE</u>	8 to 15 t/ha/year	Industrial (vertical management)  Artisanal (cooperative management)	0,5 to 2 ha Pumped water supply Permanent aeration Artificial food
<u>SUPER INTENSIVE</u>	15 to 20 t/ha/year	Industrial (vertical management)	0,25 to 1 ha Pumped water supply Permanent aeration Artificial food
<u>BIOFLOC</u>	Hundreds t/ha/year	R&D and artisanal	Few tens to hundreds m <sup>3</sup> Recirculated and heated water Permanent aeration Artificial food

# Traditional shrimp farming

- Mostly in Asia
- Extensive : some hundreds kg/ha/year
- Shrimp farming and agriculture sometimes integrated
- Farm size : few ha to a few tens of ha
- Pond size : very variable
- Farm not integrated (nor hatchery nor packaging plant)
- Sometimes nursery or pre-growing
- These traditional practices are disappearing more and more because of their unprofitability....and sometimes because their unsustainability.



Bangladesh, *P. monodon*  
freshwater(2003)





Indonesia (Borneo)  
Mahakam delta





Indonesia, Borneo; Mahakam delta extensive farms (2006)



# Artisanal shrimp farming

- Mostly in Asia
- Semi-intensive : 2 to 3 t/ha/year
- Farm size : small, few ha
- Pond size : currently 0,5 to 1ha
- Not integrated
- Sometimes nursery or pre-growing
- Traditional rice paddies → shrimp aquaculture ponds ...much more profitable
- The most widespread shrimp aquaculture practices in the world
- Intensive: 10 t/ha/year to super intensive farm 20/ha/year



India, Andhra Pradesh Gudur 28 km from the sea (2015)



Vietnam, intensive farms in (2012)



French Polynesia, Tuamotu island (2015)



# Pre-industrial shrimp farming

- Mostly South America and Asia
- Yield from 2 to 5 and 8 to 15 t/ha/year (1/2 intensive to intensive models)
- Farm size: some tens to hundreds ha
- Pond size: 0,5 to 10 ha
- Farm integrated with hatchery and sometimes packaging plant
- The semi Intensive model started in Ecuador in the early 1980s.
- Intensive model started in Taiwan and Thailand at the late 1980s.





Equator; « light » and industrial semi intensive farm (1985)



China, intensive farm (2012)



Desert of Sultanat of Oman, intensive and industrial farm ( 2010)

# Industrial shrimp farm

- South America, Saudi Arabia, South East Asia, Madagascar
- Light to heavy semi-intensive: 4 t/ha/year to 8 t/ha/year
- Farms area > 200 ha
- Currently pond size: 10 ha
- Integrated farm: hatchery, packaging plant and sometimes feed mill
- International markets

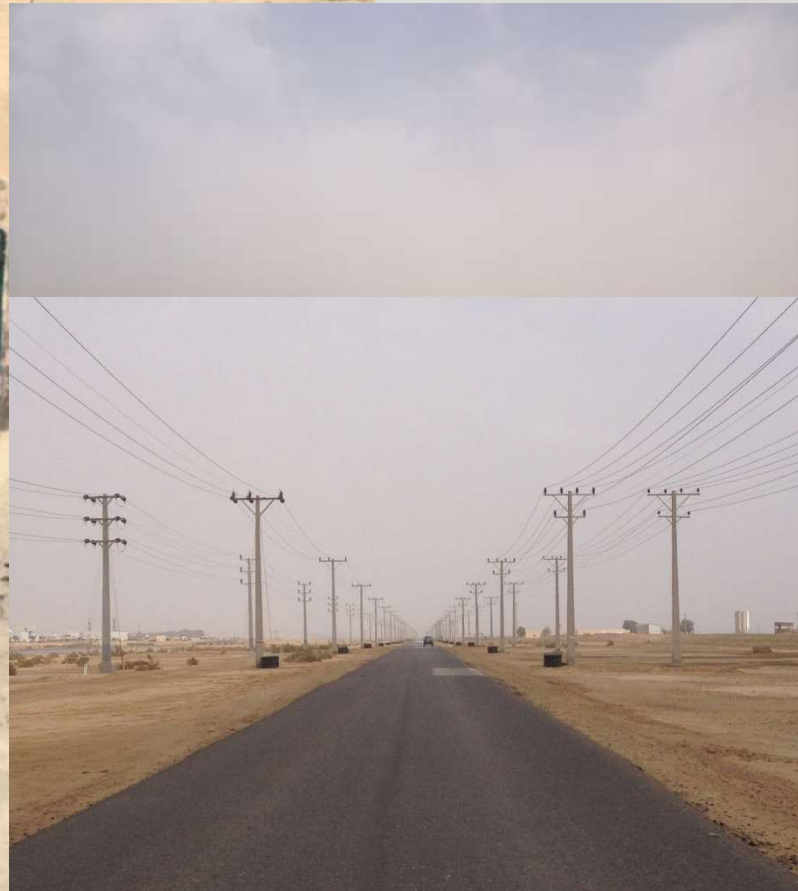




Belize: industrial intensive integrated farm (2006)



Equator; intensive shrimp farm under greenhouse (2007)



> 40 Km

Saudi Arabia; fully integrated farm with ... more 6 500 ha of ponds 25 000 T/ year (2017)



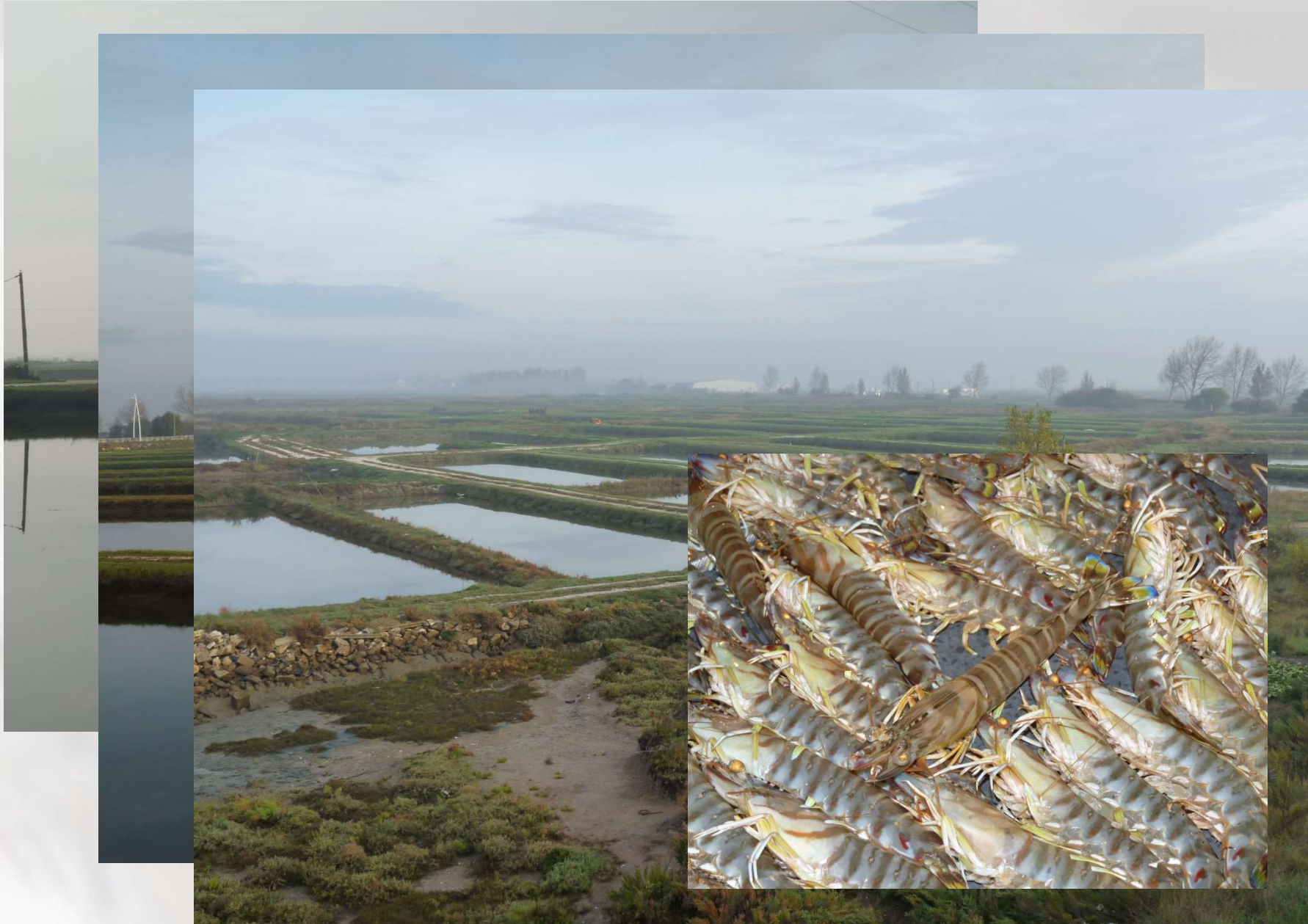


4.

## Future of shrimp farming in Europe

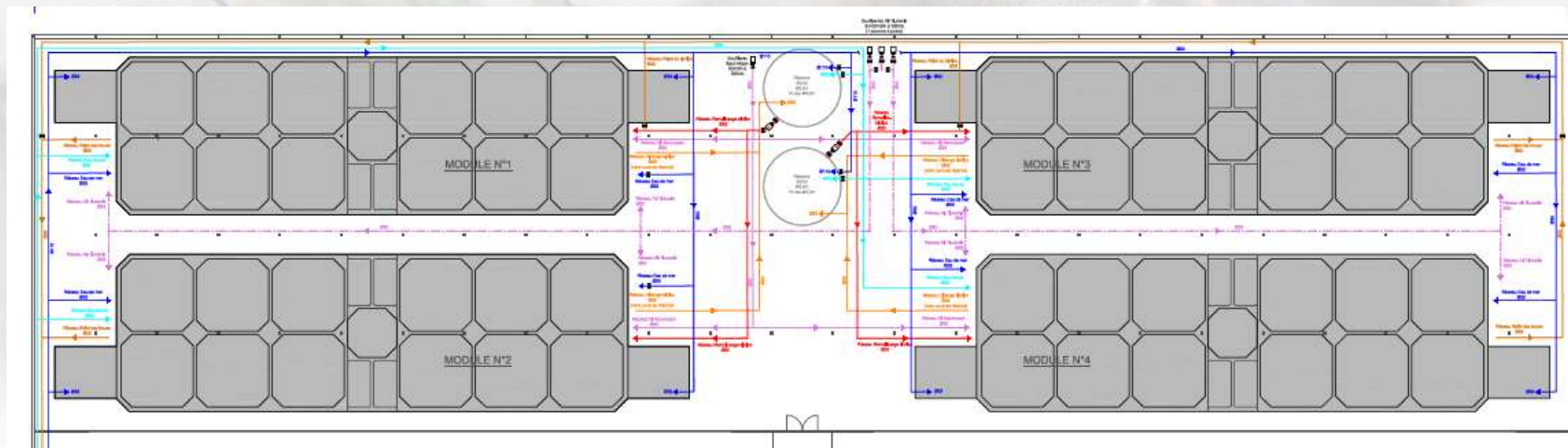
# Tow ways....

- Use of wetland with semi-intensive model; Spain, France, Italy
  - *P.japonicus*
  - Summer production
  - 0,4 to 1 ton/ha/year (one crop)
  - Local markets
  - Only  $\approx$  200 t/year in Europe



# Tow ways....

- Biofloc technology
- Pilot farms in Spain, Italy, Belgium, Germany...
- Projects in France, Switzerland, Greece, Russia...
- Subject of his workshop



# SYSTEMS AND SPECIES IN WORLDWIDE SHRIMP FARMING

THANK YOU



Engineering and Consultancy Office  
Specialised in **Aquaculture**

[www.ideeaquaculture.com](http://www.ideeaquaculture.com)

45