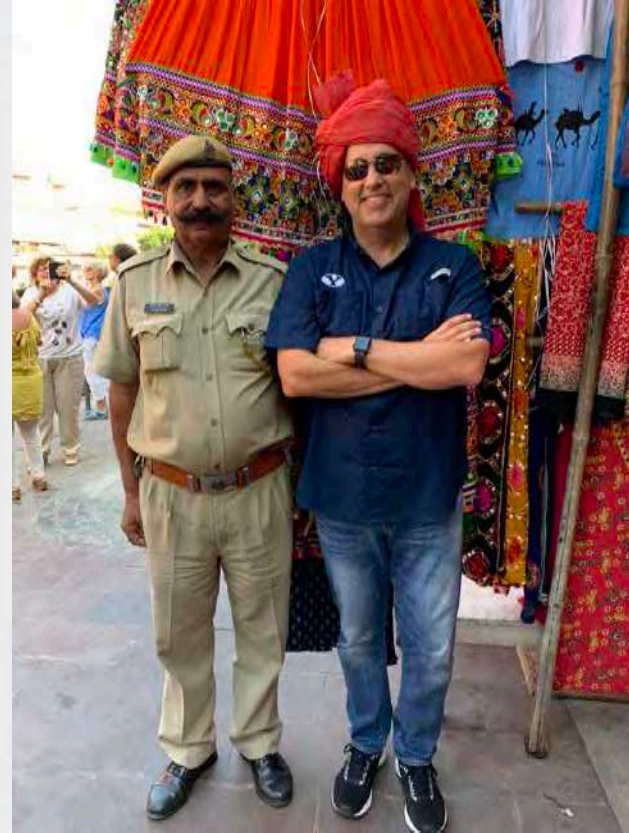


Thank you to our
gracious hosts
here in India!



Some of us really got into the spirit of things.



BIG 3 Winners...Most Active on the App

1. Jorge Sanabria (Pescanova) – 1,165 points
2. Senthil Kumar (Society of Aquaculture Professionals) – 219 points
3. Vijayanand Dhanakoti (Salem Microbes PVT LTD) - 174 points
- 139 (t). Travis Larkin (Seafood Exchange) – 10 points



Current Scenario



Export Trade **\$7 Billion** or **¥49.59 Billion**



Introduced **Vannamei Shrimp** to India

Running Global Standard "Aquatic Quarantine Facility (AQF)"



3rd Largest **Fish Producer**

2nd Largest Aquaculture Producer



Largest Supplier of Shrimp to **USA & Japan**

Enrolled about **70k Farms** with Geo-Tagging



4th Largest Exporter of Sea Food



[Who We Are](#)[What We Do](#)[Where to Find](#)[Producers](#)[PORTal](#)

Keeping Fish in Our Future

Farmed seafood that's safe,
sustainable, and ethically sourced

[Learn More About Us](#)

Our Global Impact

Improving production in 34 countries

Responsible seafood production is a global effort to keep fish in our future. BAP certification is transforming the farmed seafood industry in 34 countries.

[Learn More](#)



300,000+ jobs at certified facilities

Responsible aquaculture provides jobs to support communities and ensures that workers are paid fairly and treated well.

[Meet a BAP Producer](#)

21 billion meals with BAP- certified seafood

BAP helps keep fish in our future, delivering a healthy protein to billions of people worldwide. Responsible farming protects wild fisheries from being over-exploited so that seafood can be served for years to come.

Where to Find



Fabrice DeClerk: Seeking a healthy diet from a sustainable food system—the scale of the challenge



2 billion people lack key micronutrients like iron and vitamin A



155 million children are stunted



52 million children are wasted



2 billion adults are overweight or obese



41 million children are overweight



88% of countries face a serious burden of either two or three forms of malnutrition

And the world is off track to meet all global nutrition targets



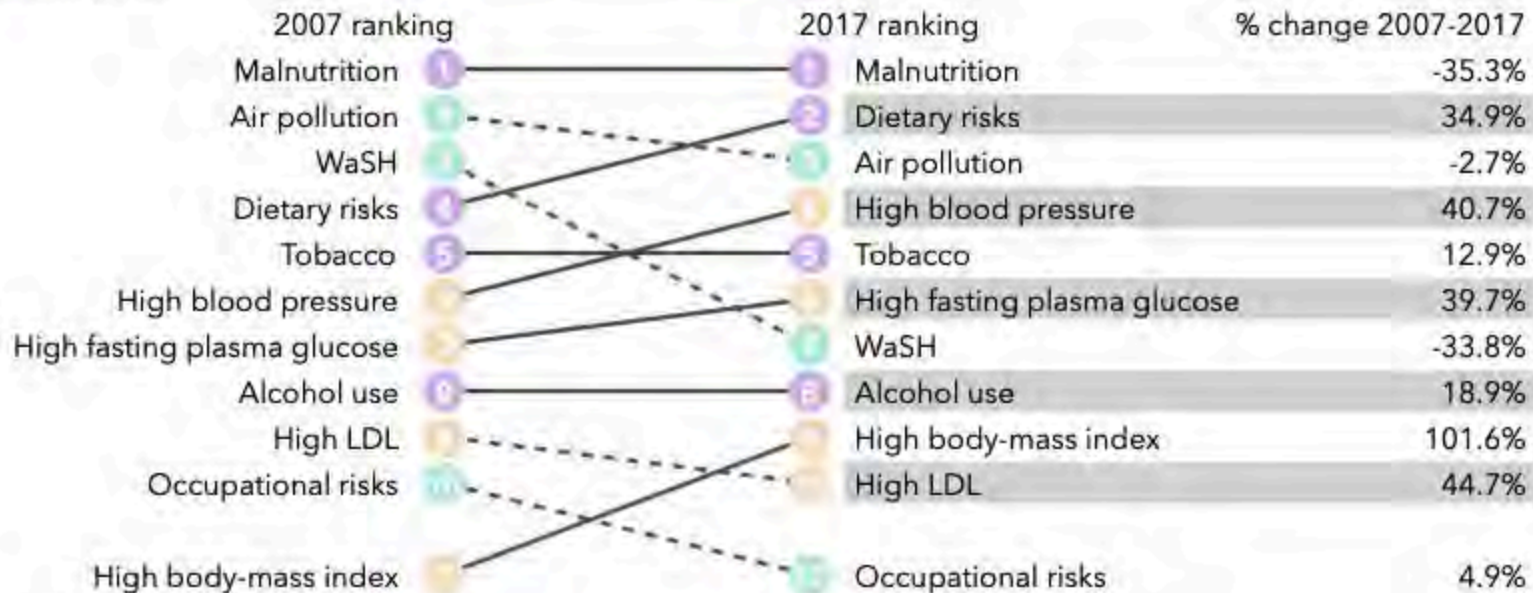
Target 1 – Healthy Diets

2500 kcal/day



		Macronutrient intake grams per day (possible range)	Caloric intake kcal per day
	Whole grains Rice, wheat, corn and other	232	811
	Tubers or starchy vegetables Potatoes and cassava	50 (0-100)	39
	Vegetables All vegetables	300 (200-600)	78
	Fruits All fruits	200 (100-300)	126
	Dairy foods Whole milk or equivalents	250 (0-500)	153
	Protein sources		
	Beef, lamb and pork	14 (0-28)	30
	Chicken and other poultry	29 (0-58)	62
	Eggs	13 (0-25)	19
	Fish	28 (0-100)	40
	Legumes	75 (0-100)	284
	Nuts	50 (0-75)	291
	Added fats		
	Unsaturated oils	40 (20-80)	354
	Saturated oils	11.8 (0-11.8)	96
	Added sugars		
	All sugars	31 (0-31)	120

What risk factors drive the most death and disability combined?

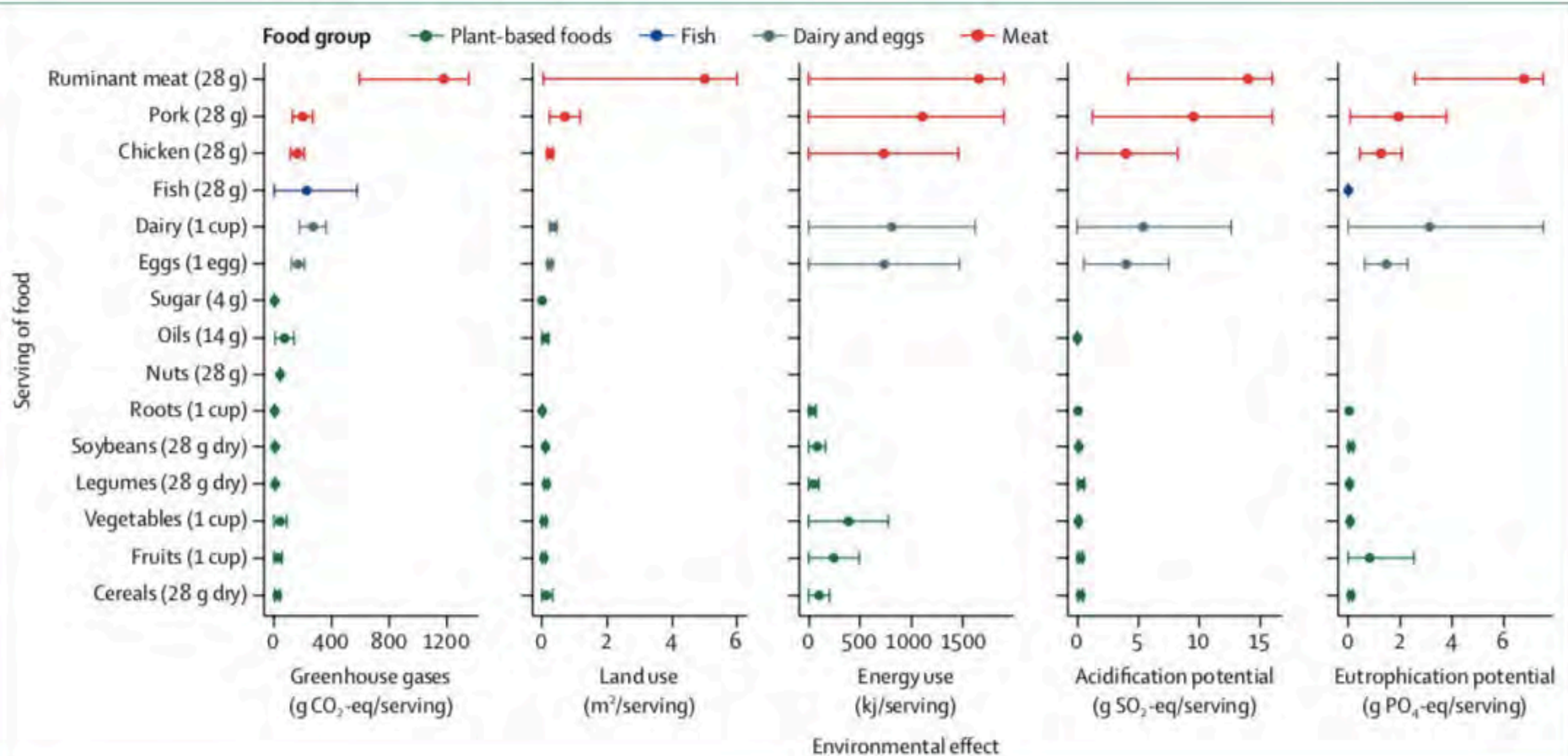


IHME

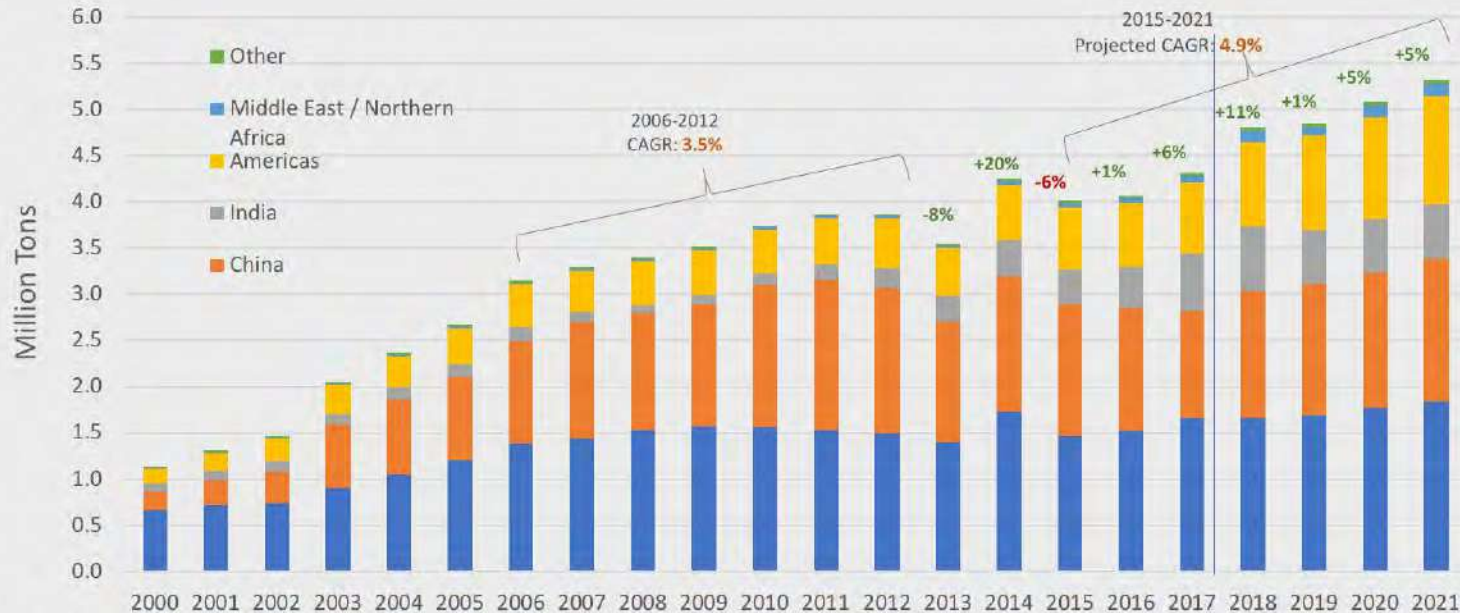
Measuring what matters

is contributing to DALYs in 2017 and percent change, 2007-2017, all ages, number

Impacts vary by crop, practices, location, and environmental criteria



Shrimp Aquaculture Production (2000-2021)



Sources: FAO (2019) for 2000-2009; GOAL (2011-2018) for 2010-2017; GOAL (2019) for 2018-2021.

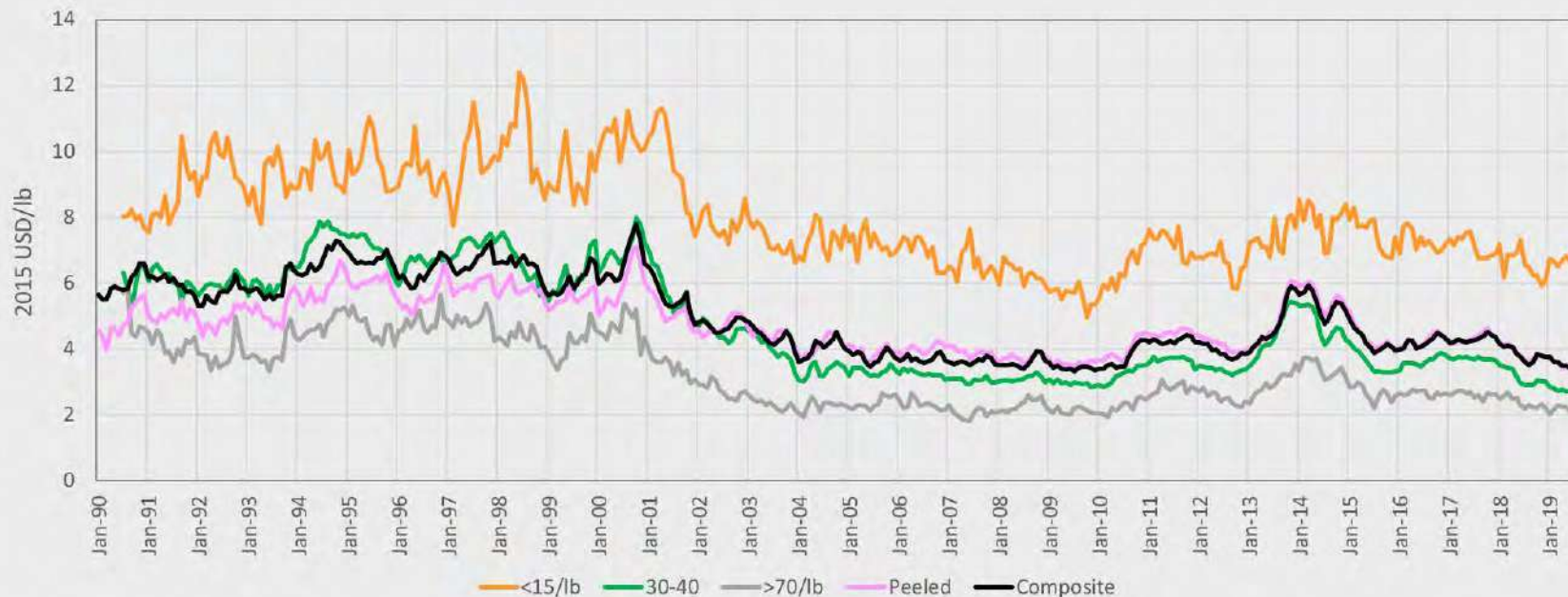
Southeast Asia includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar and Taiwan.

Species included are *L. vannamei*, *P. monodon* and Other. *M. rosenbergii* is excluded.



Trends in U.S. Shrimp Import Prices

Real Prices

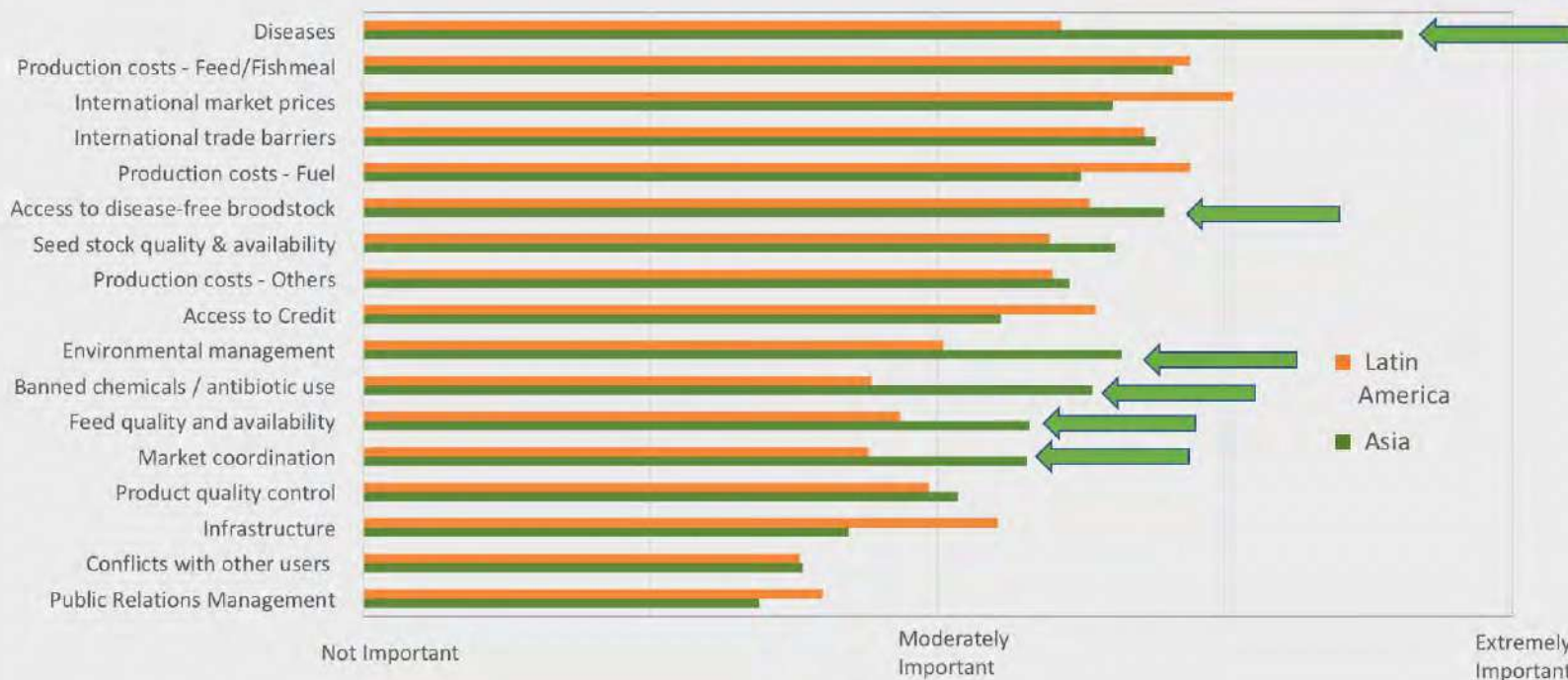


Real prices increased sharply in 2013

Source: USDC/NMFS (2019)

Top Issues and Challenges in Shrimp Aquaculture – GOAL 2019 Survey

Asia vs. Latin America



Shrimp – Jim's Key Conclusions

Top 4 Challenges to Growth:

Asia:

- Diseases (2018 – same)
- Costs – Feed (2018 - Antibiotic Use)
- Access to Disease-Free Broodstock (2018 - International Prices)
- Trade Barriers (2018- Costs-Feed)

Americas:

- International Market Prices (2018 - same)
- Costs-Feed (2018 - same)
- Costs-Fuel (2018 - Disease)
- Trade Barriers (2018 - Access to Credit)



Real Shrimp Prices:
Lowest in over 30 years

Global Shrimp Production Expectations:

2018-19: +1%

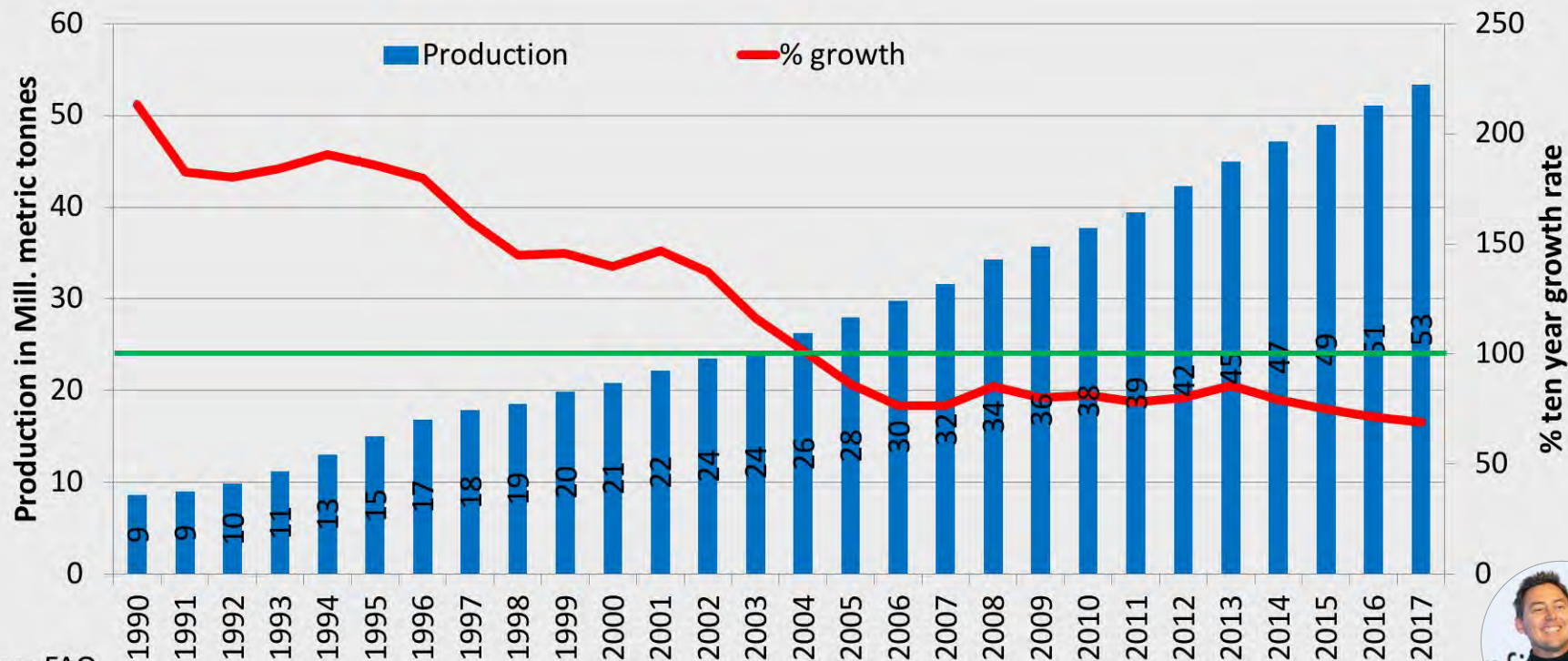
2018-2021: +3.5% per year

2021: expected to be 11% above 2018

The Global Market should be able to absorb these modest increases without further price declines...but there are disease uncertainties, a serious trade war, and global economic expectations—especially for China—that are difficult to assess.

Aquaculture Production of Fish Species and 10-year growth rate

FAO data 1990-2017

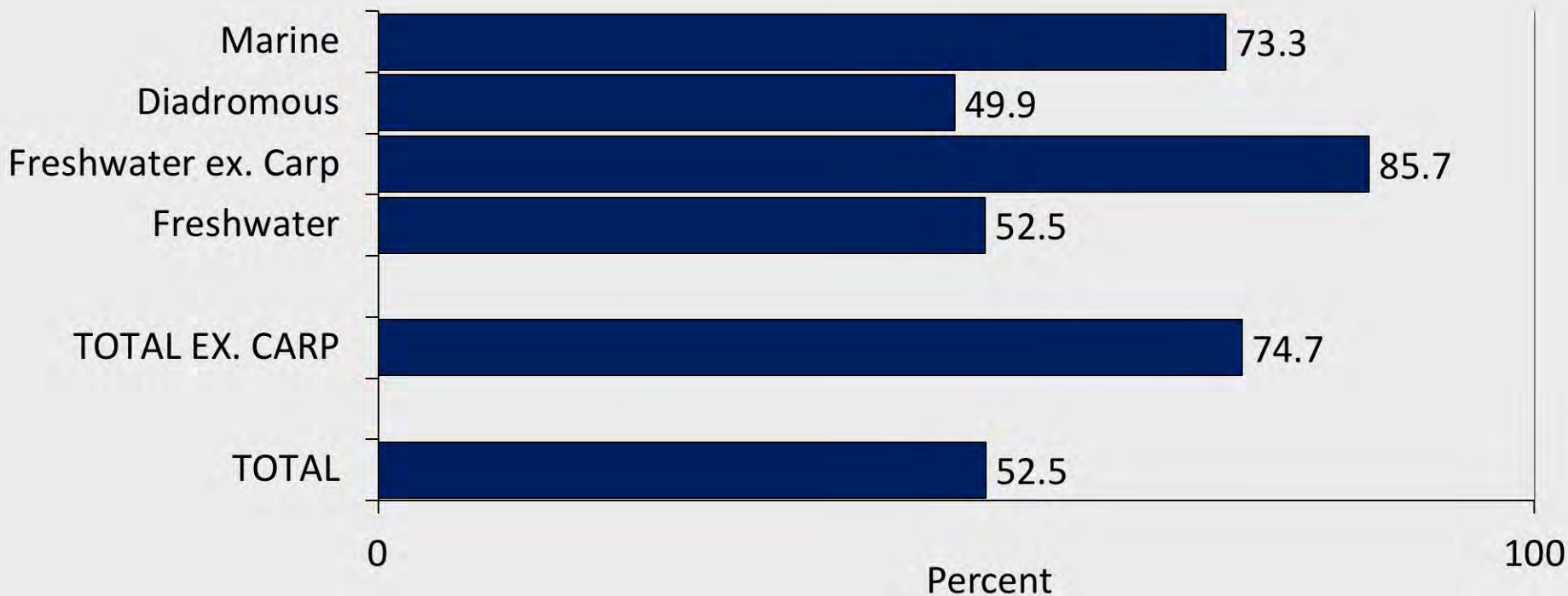


Source: FAO



Did they double in a decade?

Percentage growth, 2009-2019



What's Reshaping the Global Seafood Trade?

- **GORJAN NIKOLIK, RABOBANK**

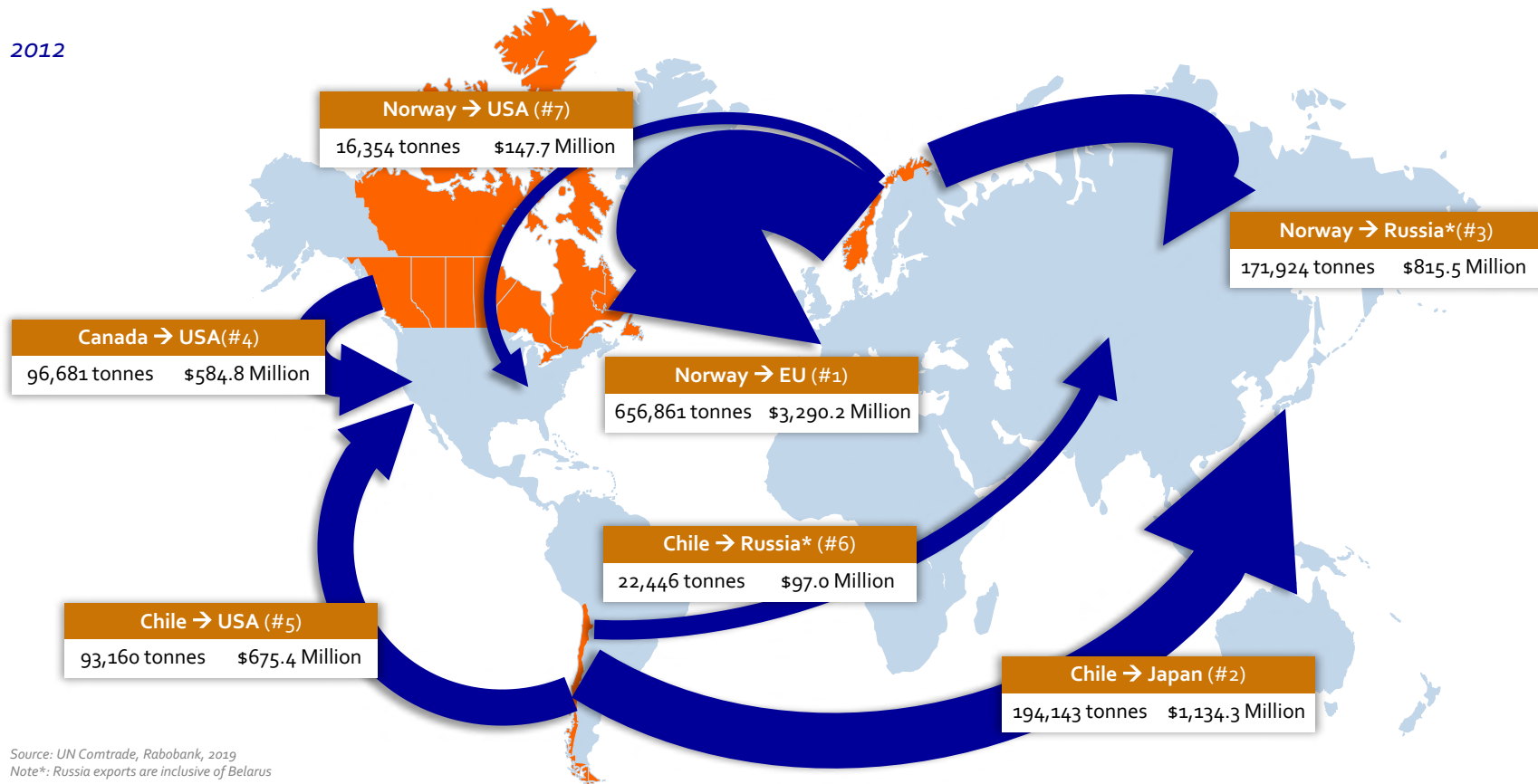




Seafood, the most traded protein globally

Salmonid trade in 2012

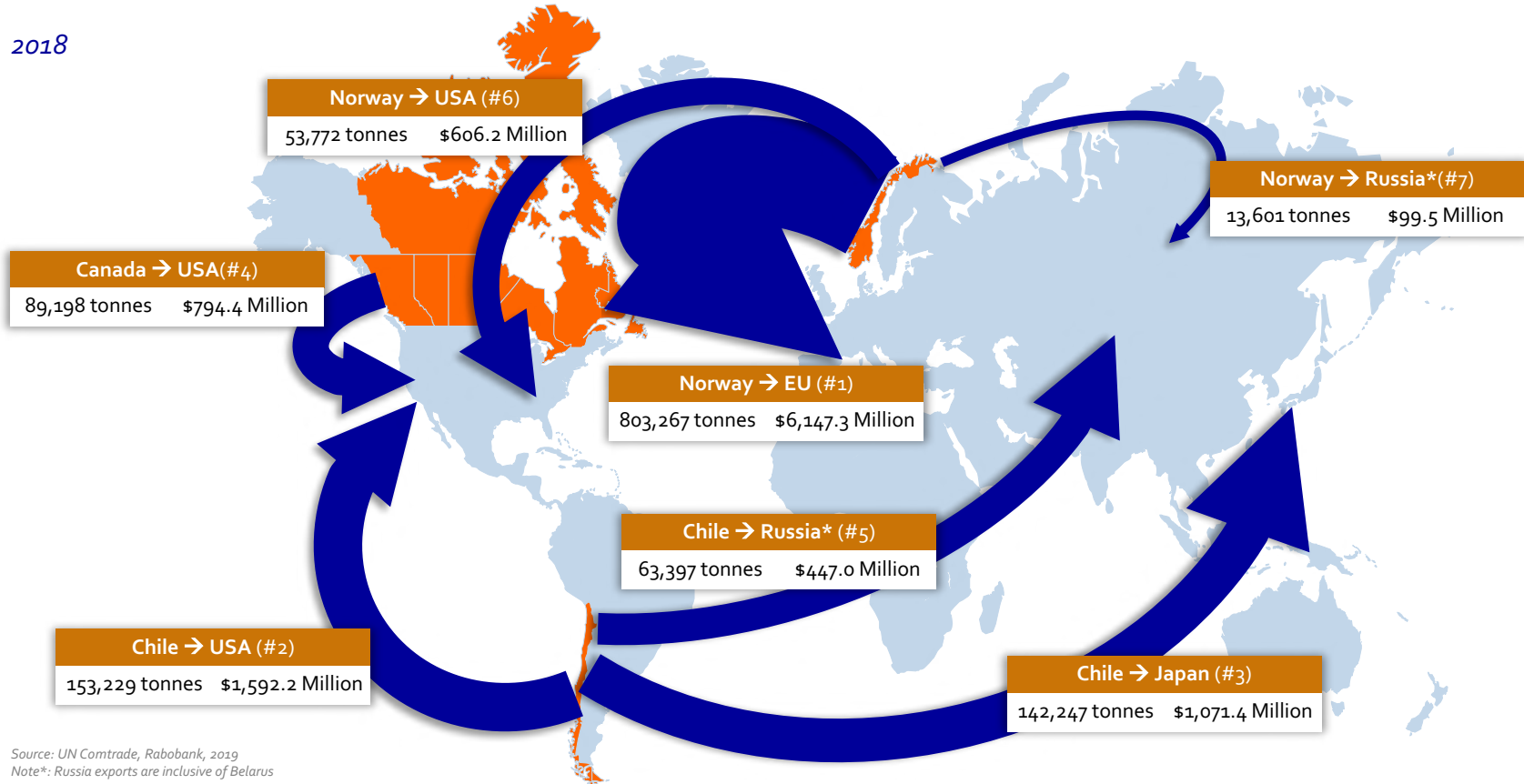
2012



Source: UN Comtrade, Rabobank, 2019
Note*: Russia exports are inclusive of Belarus

Salmon trade in 2018 shows relatively few changes so far, indicating the sector is maturing

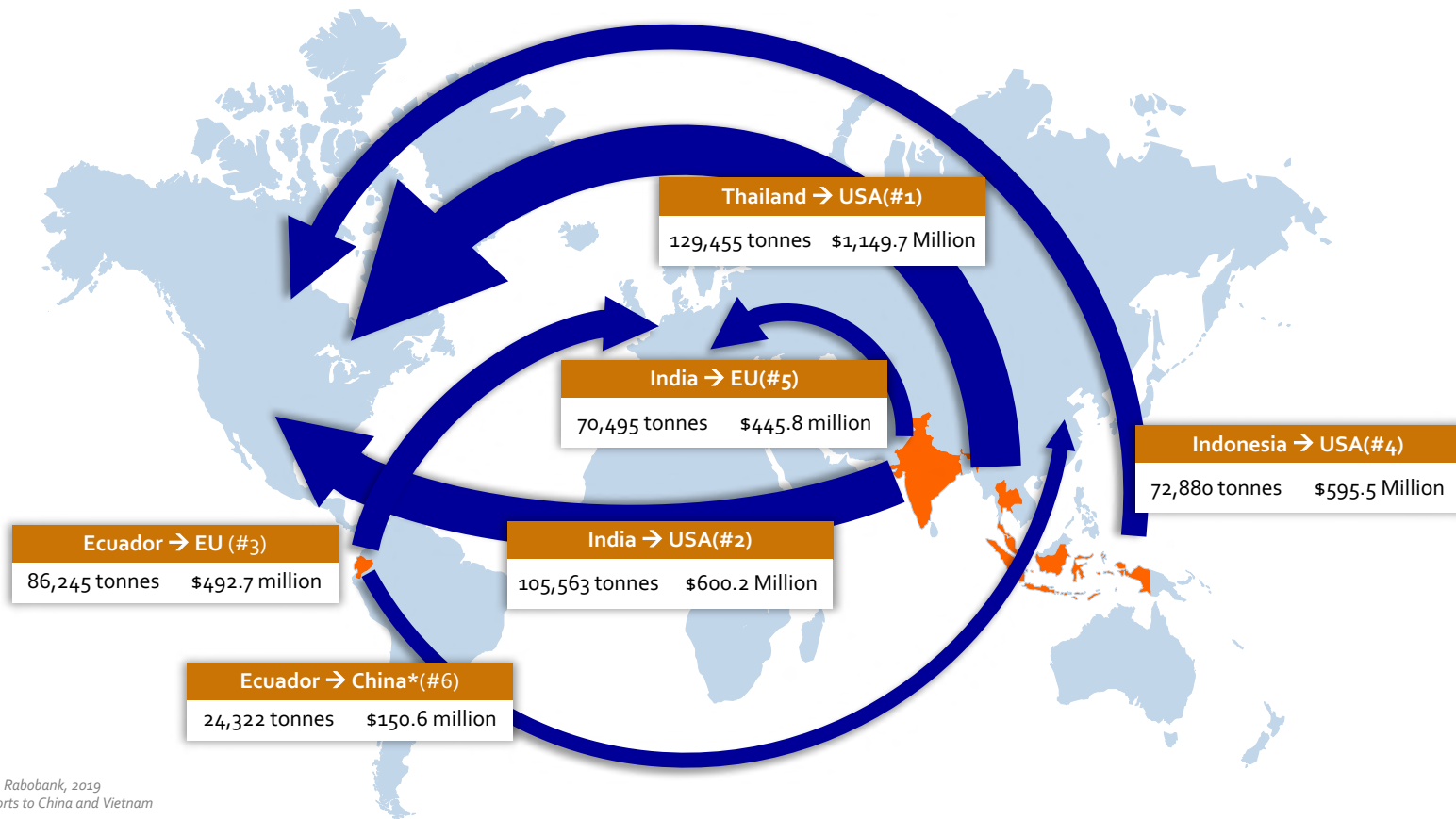
2018



Source: UN Comtrade, Rabobank, 2019
Note*: Russia exports are inclusive of Belarus

Shrimp trade in 2012, pre-peak EMS

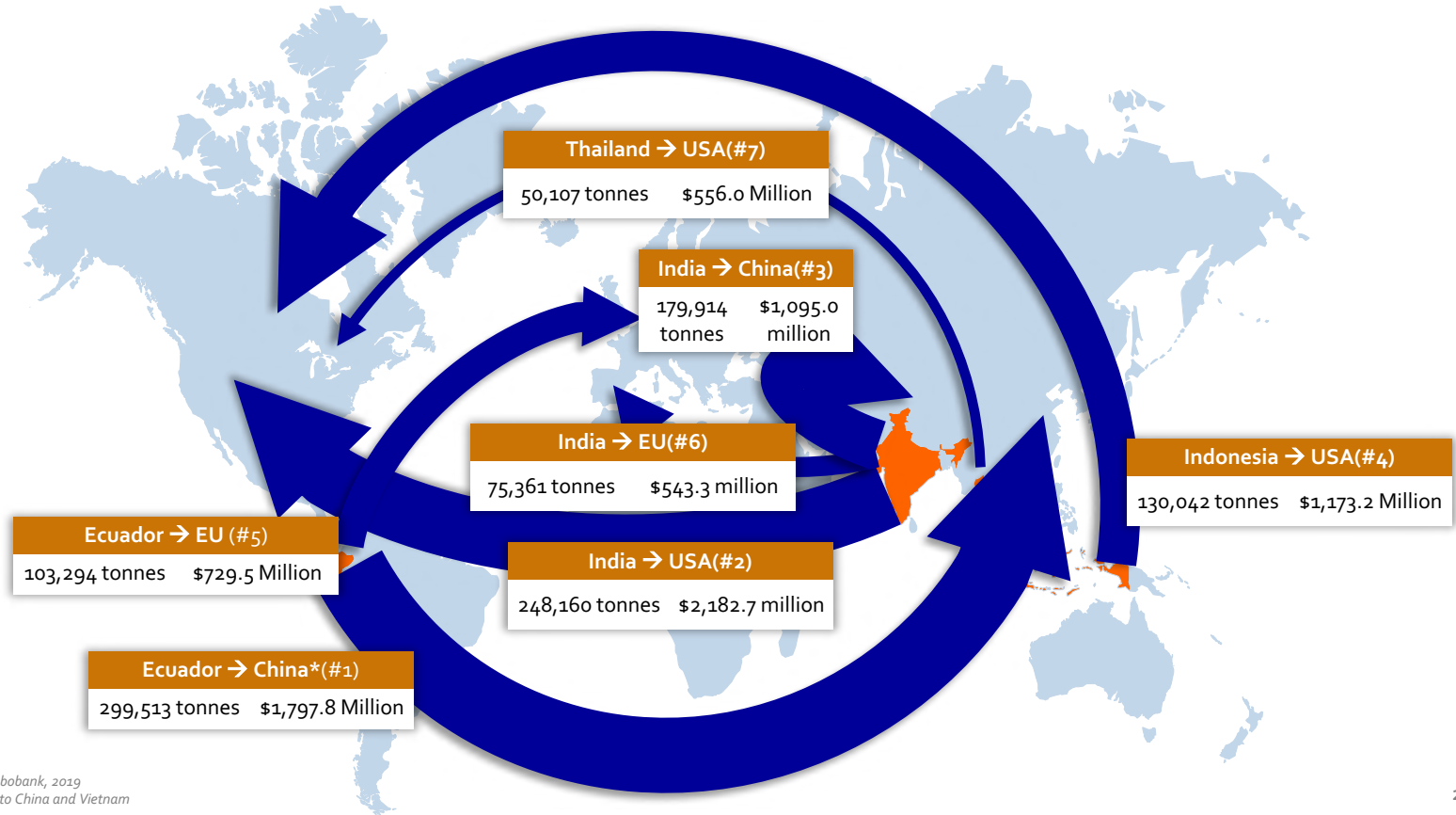
2012



Source: UN Comtrade, Rabobank, 2019
Note*: It includes exports to China and Vietnam

Shrimp trade in 2018: Major new trade flows emerge originating from Ecuador and India...This is a competitive sector

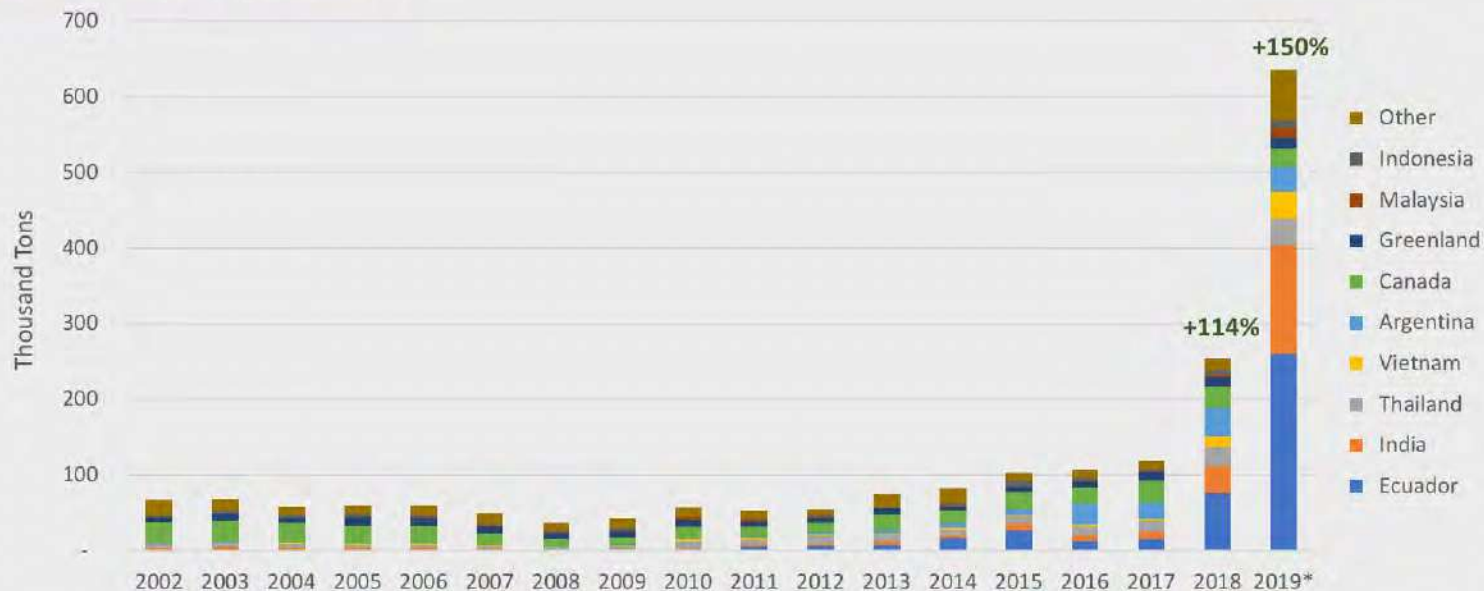
2018



Source: UN Comtrade, Rabobank, 2019
Note*: It includes exports to China and Vietnam

Chinese Shrimp Imports

Official Trade Channels

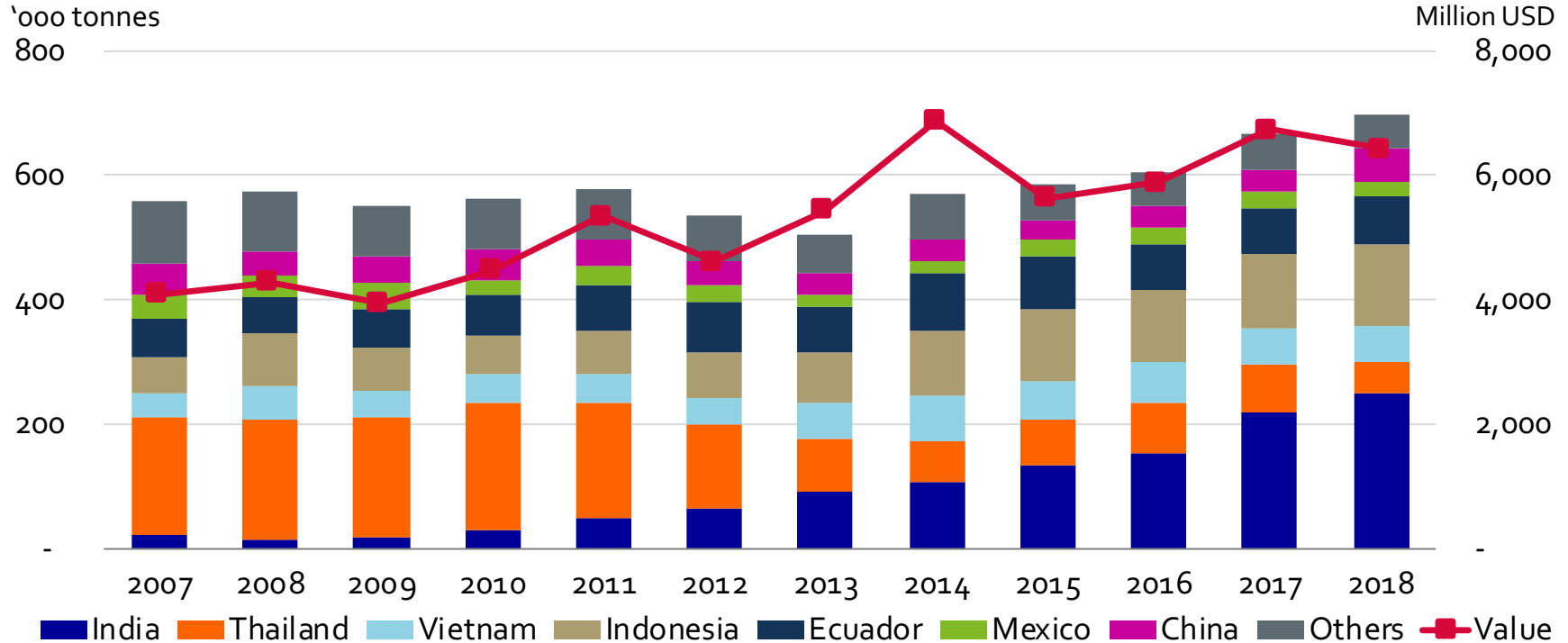


Sources: World Integrated Trade Solution (2019); International Trade Center (2019); Chinese Customs (2019).

* Estimate.

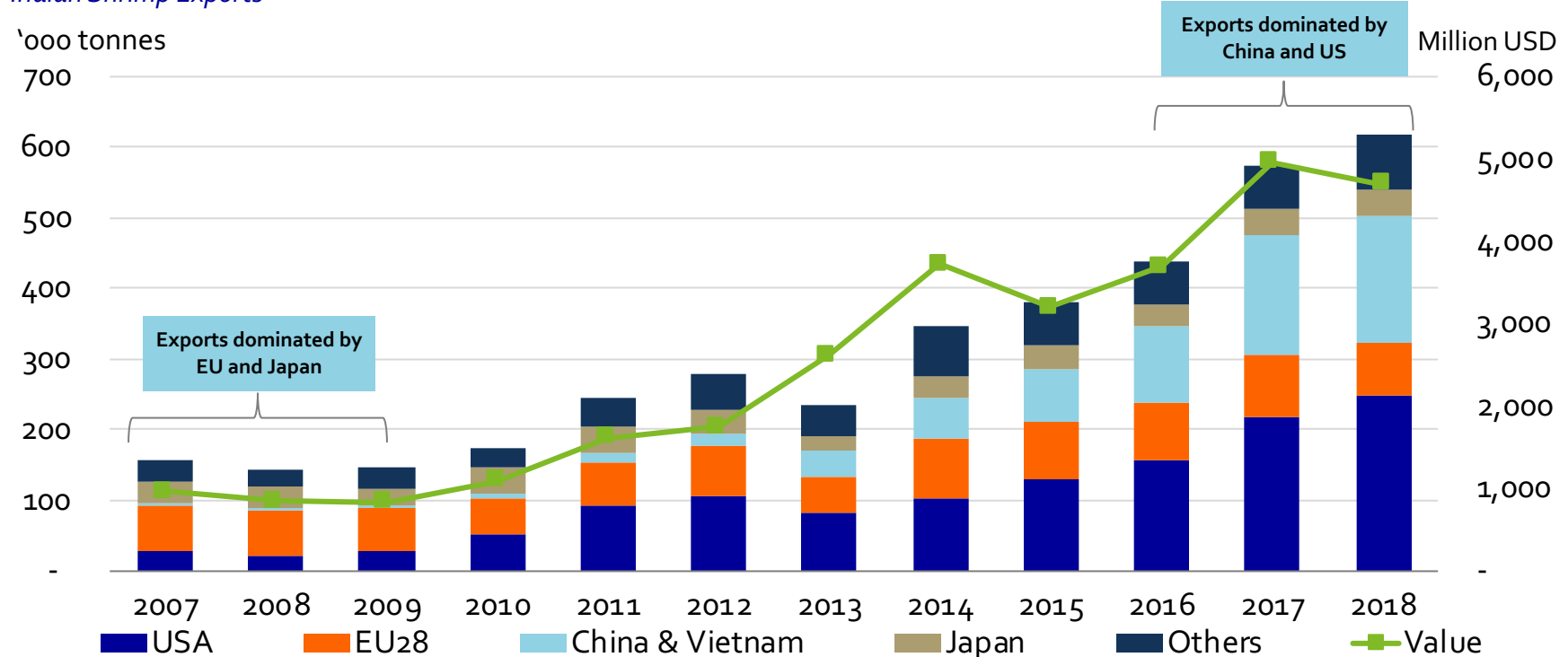
Based on US shrimp imports, a clear picture emerges of India substituting Thailand and driving growth

US shrimp imports in volume (left axis) and value (right axis)



Consequently India, once reliant on the EU and Japan, is now fully focused on US and China

Indian Shrimp Exports



Rising shrimp volumes and
dropping values?...

Data suggest it's time to focus
more on *marketing* than on
production.





Shrimp Disease Updates from Loc Tran

Major challenges:

EMS/AHPND, WSSV, EHP, White Feces Disease, SHIV?
Antibiotics residue





Loc's take-home messages

- ⇒ **Antibiotics-free** shrimp farming is doable throughout the culture cycle
- ⇒ **Functional diets, prophylaxis and fermented feed** have pretty good potentials in disease management
- ⇒ Shrimp farming will be more science-based, controlled, sustainable, more predictable and more **cost effective**.



Necessity is the Mother of Invention

Shrimp Farming has evolved over time

Generation 1

G1



No aeration,
500-3 tons/ha
Large ponds;
5-30Ha

Generation 2

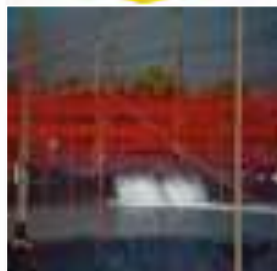
G2



Aeration, feed
3-12 tons/ha
1-2 Ha

Generation 3

G3



Viral biosecurity,
Domesticated
shrimp,
10-20 tons/ha
0.5-1 Ha

Generation 4

G4



Toilets,
Recirculation,
More aeration,
Auto-feeder
15-40 tons/ha
0.2-0.5 Ha

Generation 5

G5



Total recirculation,
total waste capture
More control on
environment
30-60 tons/ha
0.2-0.5 Ha

CONTROL IS KEY TO PRODUCING MORE FROM LESS:

	1995 (Wild <i>P. monodon</i>)	2017 Generation 4	2025 Generation 5
Yield (tons/hectare/year)	4	35	200
Days of culture (30 grams)	135	100	70
FCR	2.3	1.5	1.2
Protein retention efficiency	15	28	35
Fish in: shrimp out	3.2	0.7	0.5
Fishmeal (% fishery by product) (CPF)	0	100	100
Water exchange: m3/ton	20,000	3,600	0-200
Energy (kwh/ton)	3,400	2,750	2,400

Area to produce the World's Shrimp 10 years forward (5.0 million tons)

Generation I: 1,750,000 ha

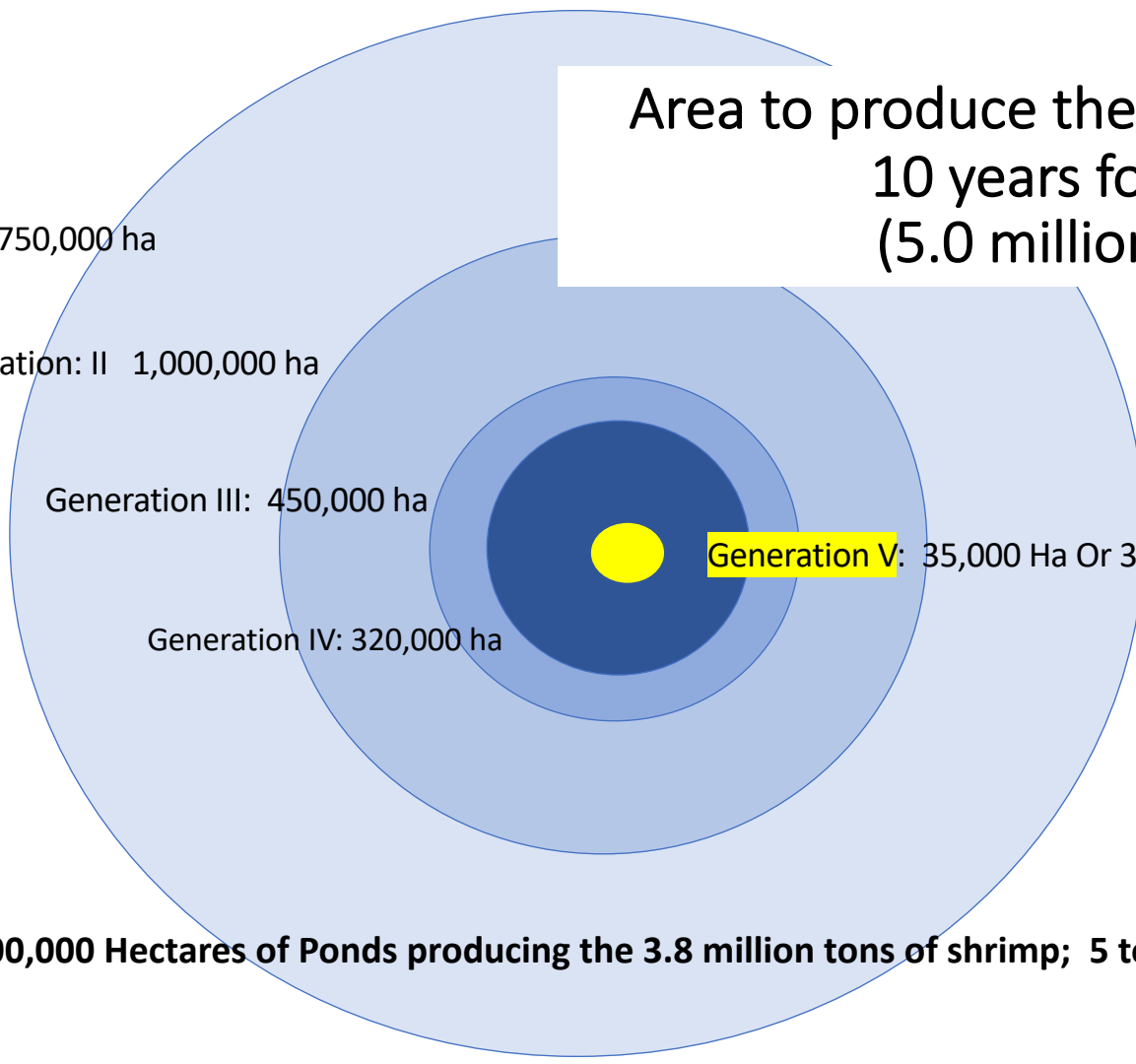
Generation II: 1,000,000 ha

Generation III: 450,000 ha

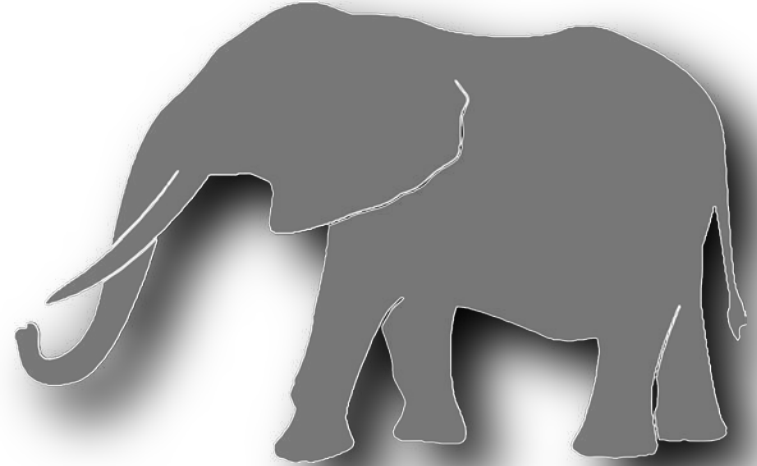
Generation IV: 320,000 ha

Generation V: 35,000 Ha Or 350 km²

Today 700-800,000 Hectares of Ponds producing the 3.8 million tons of shrimp; 5 tons/ha/year average



Donal Maguire taught us that CLAMS stands for
Coordinated Local Aquaculture Management System



CLAMS eats Elephants!

Randy Brummett of the World Bank enlightened us on the challenges and opportunities in India...

India's vast blue assets:



- 2.47 million ha of fish ponds;
- 7.8 million ha Floodplains/lakes;
- 9,058 (3.52 million ha) reservoirs;
- 1.24 million ha brackishwater;
- 388,957 km rivers;
- 5,160 glaciers;
- 7516 km coast line



...and Syed Huq shared the efforts to further Black Tiger ("Bagda") growth in Bangladesh



Ramanan Laxminarayan shared some insightful details on the current state of antibiotics

Two-thirds of the tonnage of antibiotics sold worldwide are used in agriculture and aquaculture



Insights from Aditya Dash on aquaculture in India

- **Capital needed:** Crop insurance could help facilitate lending to the industry.
- **“Aquapreneurs” needed:** Like the former investment bankers turned shrimp farmers.



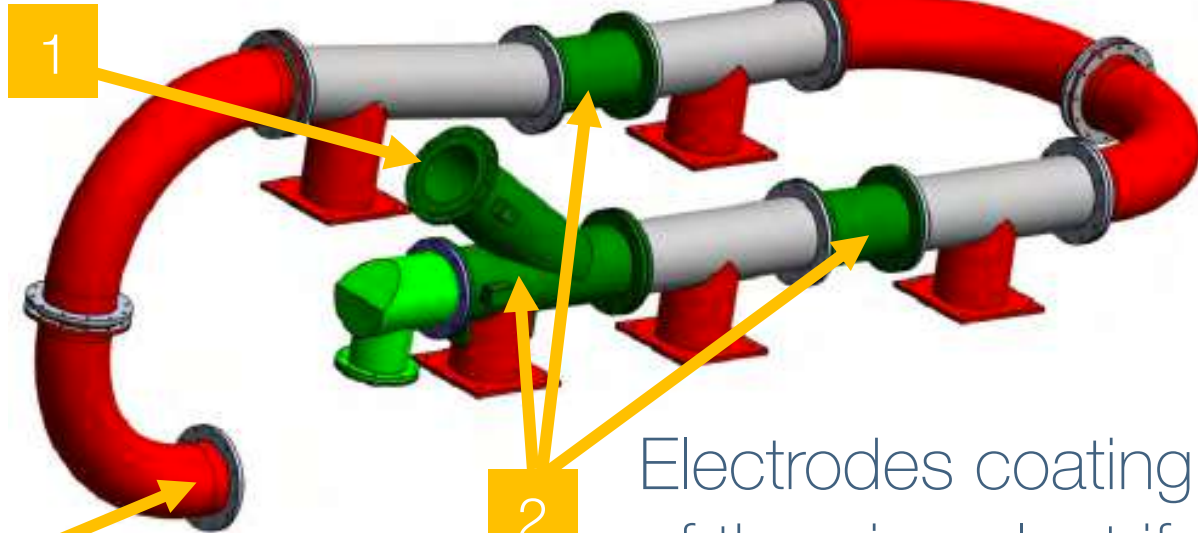
Aquaculture Innovation Award Winner: Ace Aquatech

*Awarded for invention
of “Humane Stunner
Universal”*



How in-water electric stunning works

Fish are pumped into the stunning pipeline



Fish exit to a bleeding table or ice

Electrodes coating the inside of the pipe electrify the water

We were reminded of our responsibility to everyone in our communities



In all we do, “WE IS GREATER THAN ME”



And now, a final word from our fearless leader



Andrew
Mallison
CEO
GAA





Our Challenge

CONNECT.

COLLABORATE.

COMMIT.

#GOALCONF19



In 2020, Sam's Club will:



- Undertake a pilot of a blockchain based **traceability system**. If successful, Sam's Club will apply this technology to its wild and farmed seafood supply chain.
- Work with the Best Aquaculture Practice's scheme on **enhanced social audits** in their farmed shrimp supply chain.
- Work with Global Seafood Assurance's **Responsible Fishing Vessel Scheme** and Seafood Processing Standard in their wild seafood supply chain.

A Big Thank You!



And see you in Tokyo for GOAL 2020!

