

The Present Status on World Shrimp Production and Market: Challenges and Trends

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www.globalseafood.org

An international non-government organization dedicated to advancing responsible seafood practices through education, advocacy and third-party assurances.

<p>8K+</p> <p>MEMBERS</p> <p>Our members are from across the globe</p> 	<p>25</p> <p>YEARS EXPERIENCE</p> <p>With all of our experience, we are the best at what we do</p> 	<p>3K+</p> <p>CERTIFIED FACILITIES</p> <p>BAP and BSP certification</p> 
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Digital magazine: 1.5 million page views/year



Annual leadership meeting since 2001



Aquaculture certification



Wild-catch certification



TCRS

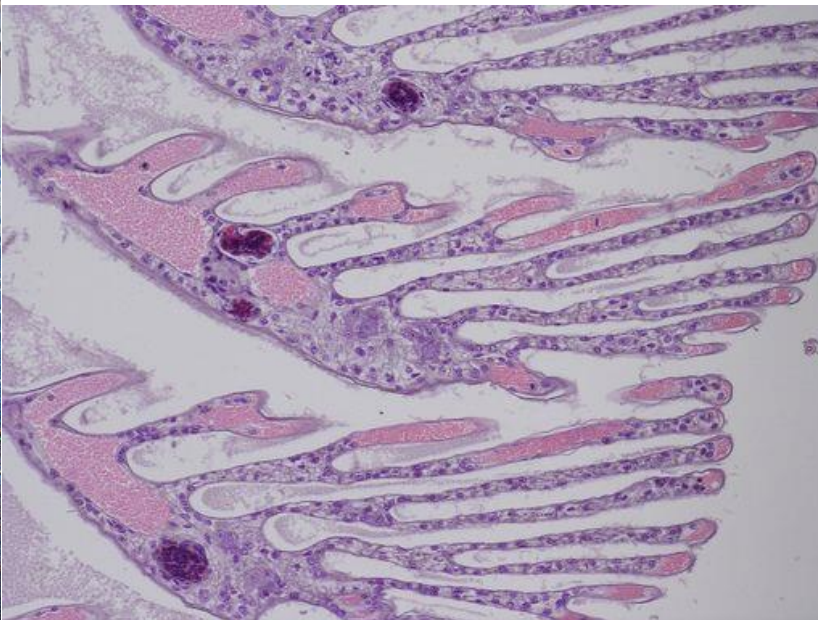
The Center for
Responsible Seafood

www.responsibleseafood.org

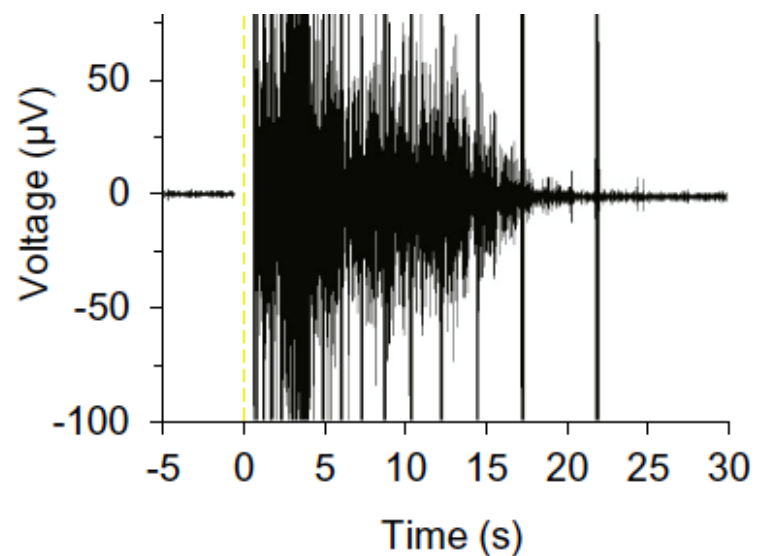
- Charitable organization founded in 2009 to pursue education and applied research
- Knowledge sharing through online educational modules and Community Platform with 750 members
- Applied research projects:



Infectious salmon anemia, Chile



Early mortality syndrome, Vietnam



Electroencephalograph for fish welfare



Revitalizing black tiger shrimp farming



Conserving hammerhead sharks in ETP

Present Status of Global Shrimp Production



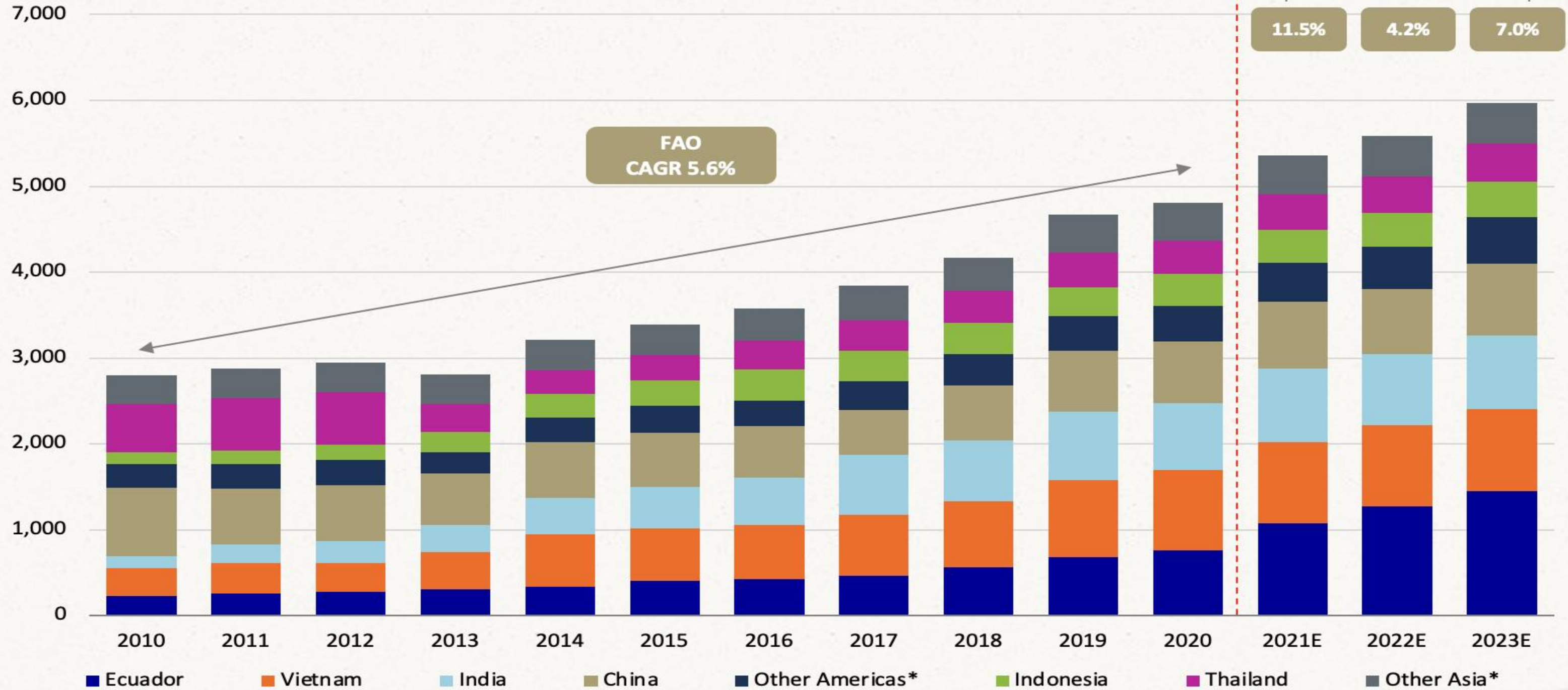
Courtesy of Gorjan Nikolic, Rabobank
GOAL 2022 in Seattle

Global shrimp supply could reach 6 million MT in 2023 as Latin America (mostly Ecuador) drives production



Global Aquaculture Shrimp

'000 tonnes

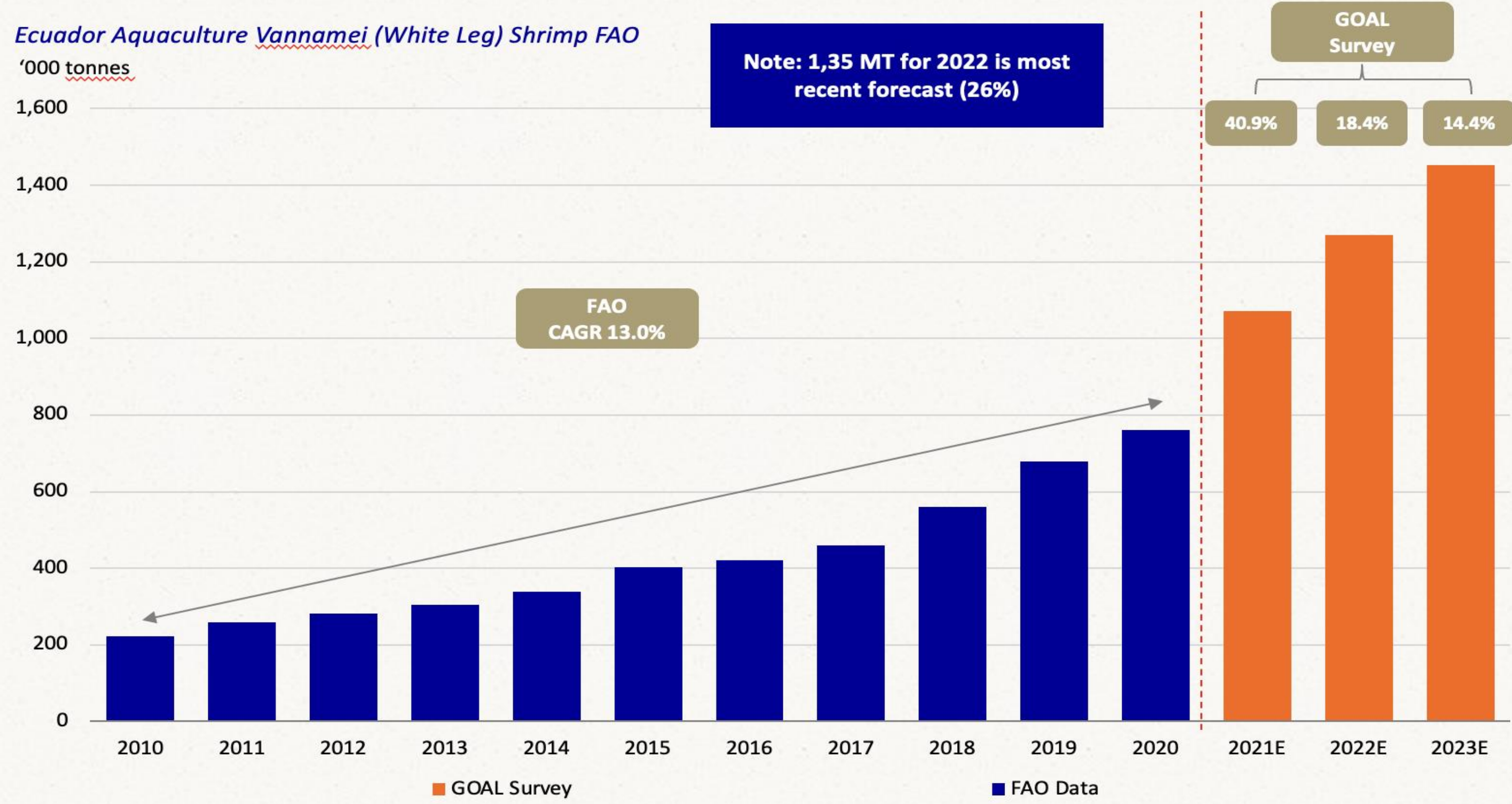


Source: Rabobank, FAO, Robins McIntosh, CP Foods, GOAL Survey 2022

Note* Other Americas include Mexico, Honduras, Peru, Venezuela, Brazil, Guatemala, Nicaragua, Colombia, Costa Rica, Cuba, Panama, Note* Other Asia include Bangladesh, Myanmar, Brunei, Japan, South Korea, Taiwan, Philippines, Malaysia, Saudi Arabia and Iran



Ecuador's shrimp industry is the fastest growing major aquaculture industry in the world

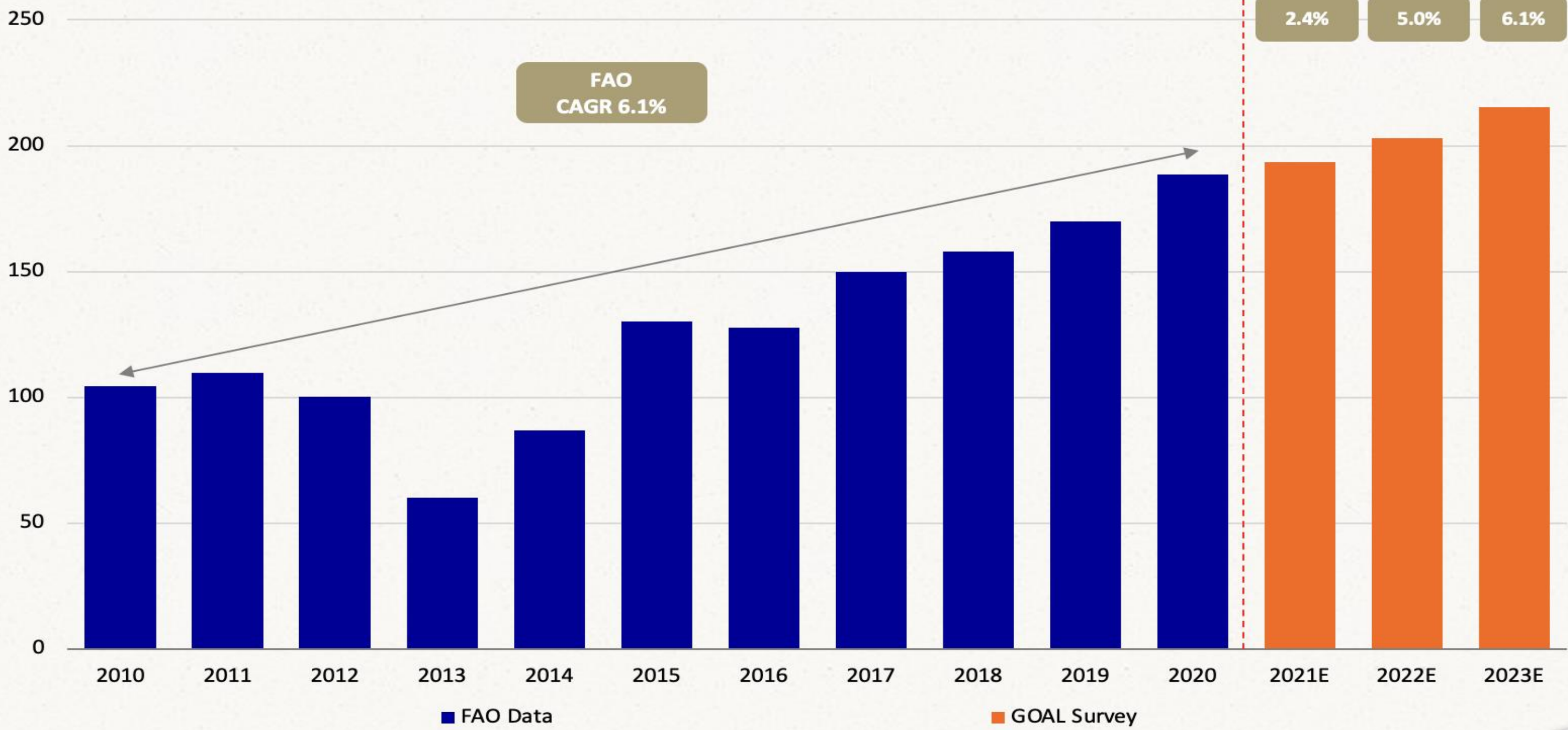


Source: Rabobank, FAO, GOAL Survey 2022

Mexico's shrimp industry is growing steadily at 5-6%

Mexico Aquaculture Vannamei (White Leg) Shrimp FAO

'000 tonnes



5%

FAO CAGR 6.1%

GOAL Survey
2.4% 5.0% 6.1%

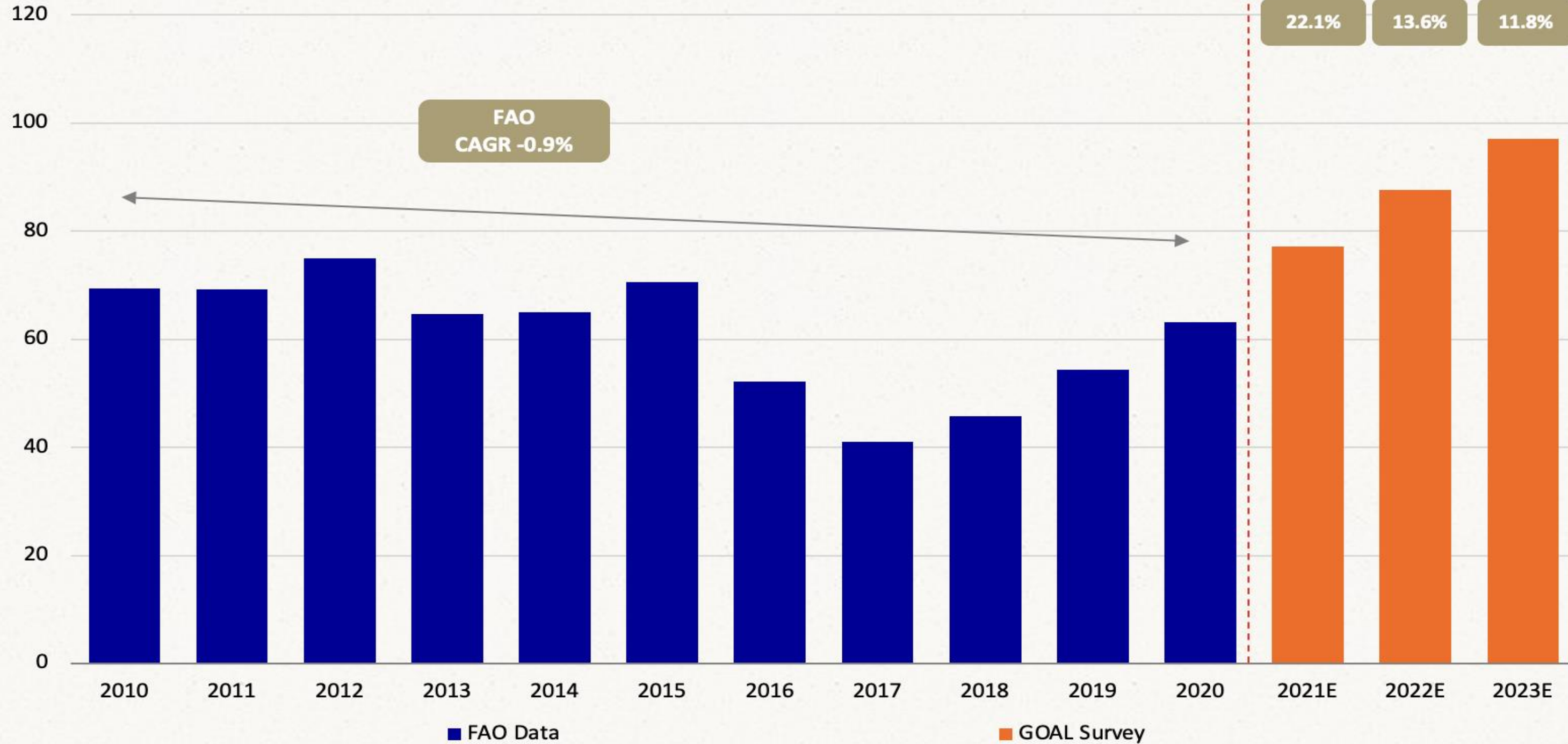
Source: Rabobank, FAO, GOAL Survey 2022

Brazil's shrimp producers had a great 2021 and now growing with 12 to 14% p.a.



Brazil Aquaculture Vannamei (White Leg) Shrimp FAO

'000 tonnes



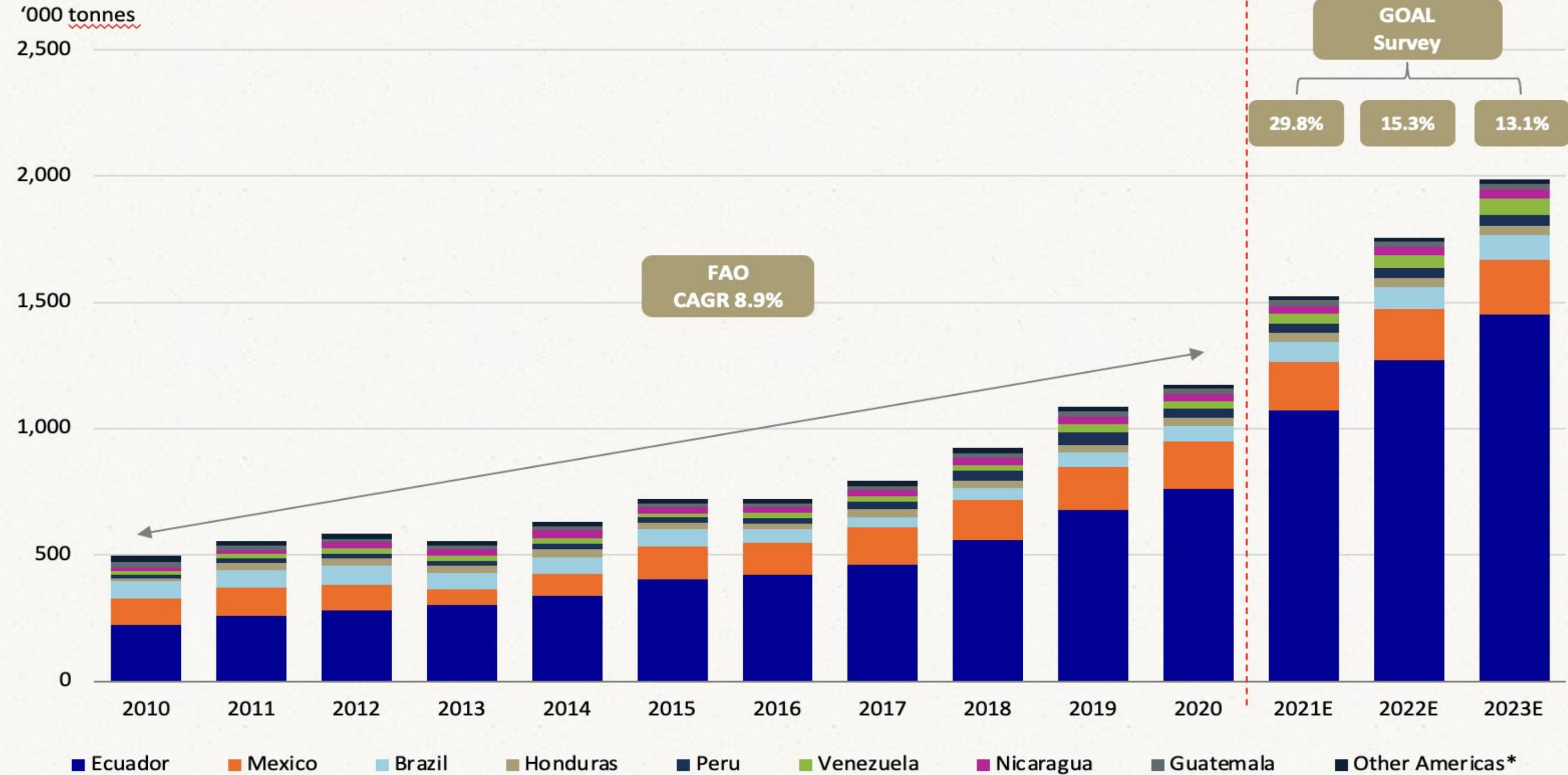
Source: Rabobank, FAO, GOAL Survey 2022



Driven by Ecuador Americas shrimp production set to reach 2 million MT in 2023



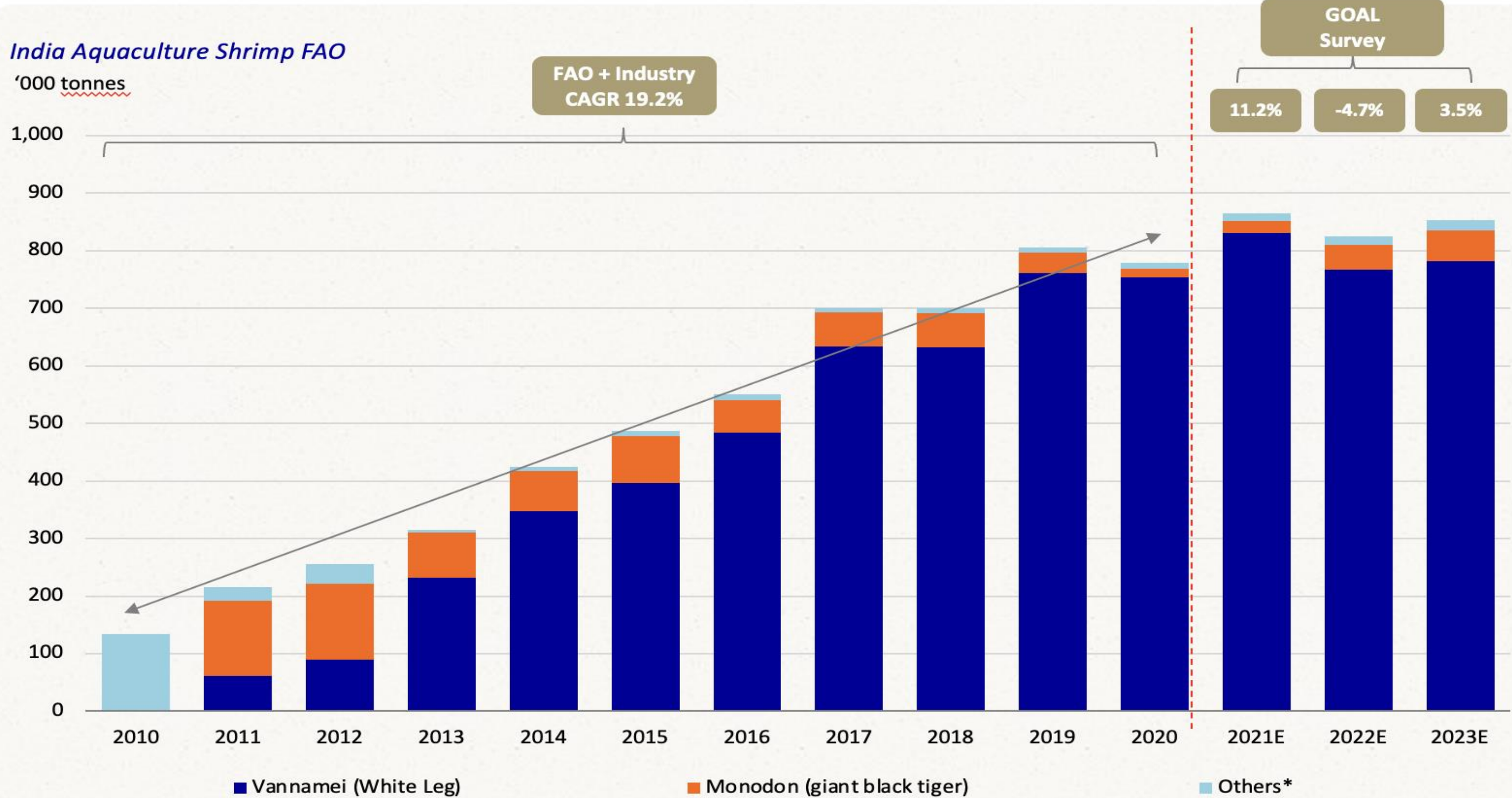
Americas Aquaculture Vannamei (White Leg) Shrimp FAO



Source: Rabobank, FAO, GOAL Survey 2022
Other Americas* Colombia, Costa Rica, Cuba, Panama,



Indian shrimp production is contracting again in 2022; due to several factors (diseases, weather, feed costs, falling prices)



Note: We did not use FAO data for 2020 for India as it conflicted with all other sources

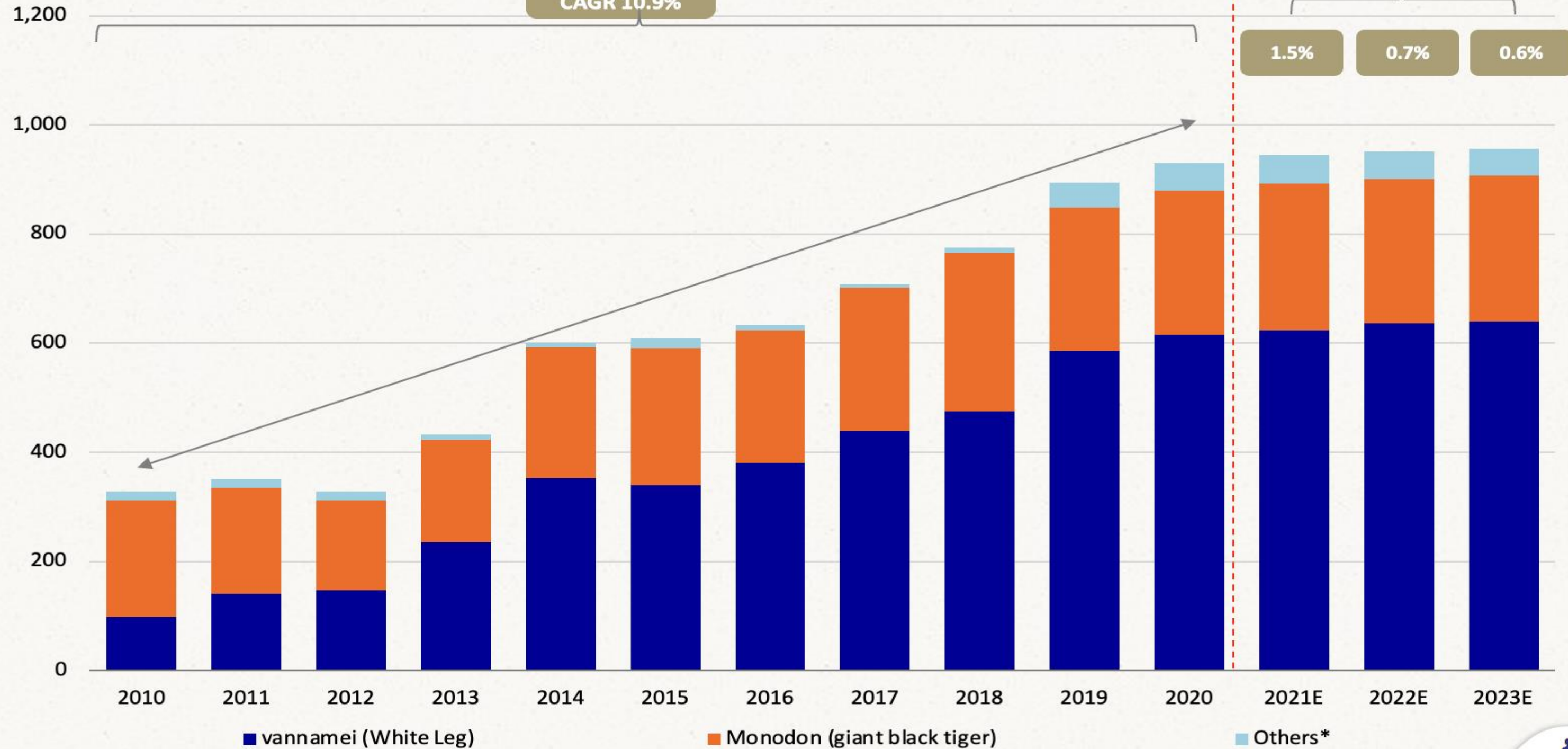
Source: Rabobank, FAO, GOAL Survey 2022
 Note: 2010 - FAO Data, 2011 to 2019 - Manoj Sharma, Industry Expert, 2020 to 2023 - GOAL Data
 Note* Others include Giant river prawn, Indian white prawn, Penaeus shrimps nei, River prawns nei

Vietnamese shrimp production seems to have slowed down considerably since 2020



SE Asia - Vietnam Aquaculture Shrimp Production FAO

'000 tonnes



Source: Rabobank, FAO, GOAL Survey 2022
 Note* Others include Banana prawn, *Metapenaeus shrimps nei*

Note: We do use FAO data for Vietnam, although it is considered to be marginally overestimated

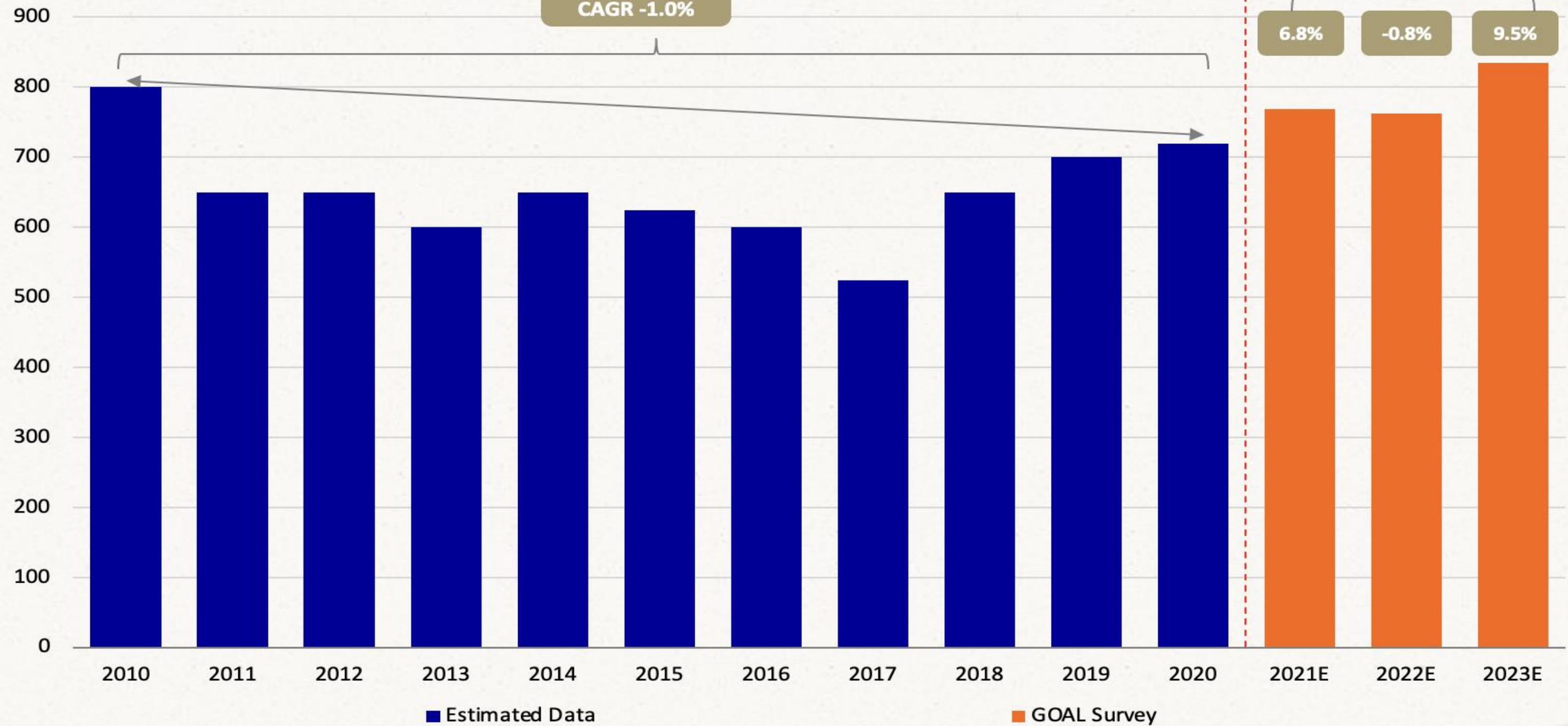


Chinese shrimp supply is having a difficult 2022, but good growth is expected for 2023



China Aquaculture Shrimp FAO

'000 tonnes



Note: We do not use FAO data for China as it is considered to be a considerable overestimation

Source: Rabobank, Robins McIntosh, CP Foods, GOAL Survey 2022

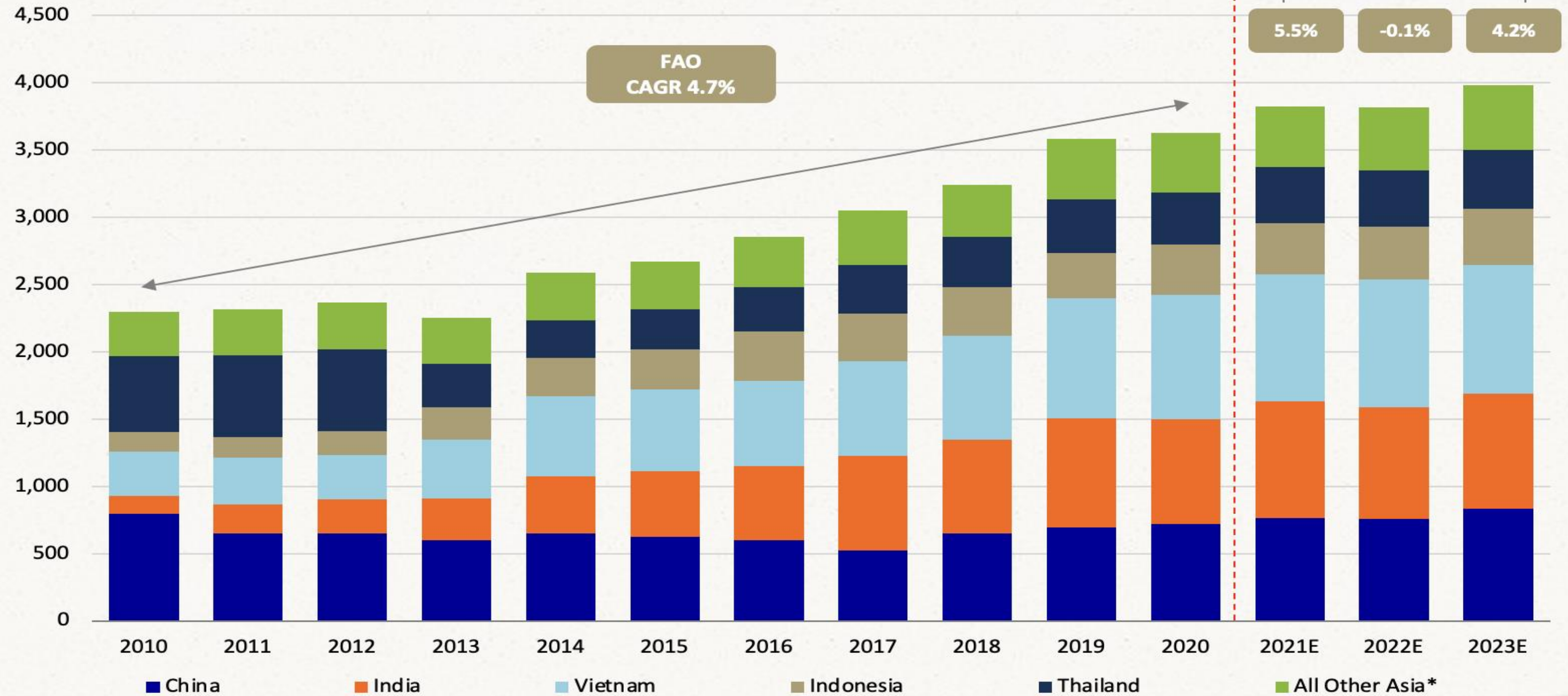


Asia: Shrimp supply to decline slightly in 2022 (first decline since 2013) but growth will resume in 2023 to reach nearly 4m MT



SE Asia Aquaculture Shrimp

'000 tonnes



Source: Rabobank, FAO, Robins McIntosh, CP Foods, GOAL Survey 2022
 Note* All Others include Bangladesh, Myanmar, Brunei, Japan, South Korea, Taiwan, Philippines, Malaysia, Saudi Arabia and Iran

Production Summary: Optimistic outlook for 2023

Why is Ecuador booming, while others are flat?

Region	CAGR 2010-2020	2021 expected	2022 expected	2023 expected
India	19.2%	11.2%	-4.7%	3.5%
Ecuador	13.6%	40.9%	18.4%	14.4%
Vietnam	10.9%	1.5%	0.7%	0.6%
China	-1.0%	6.8%	-0.8%	9.5%
Indonesia	10.2%	5.2%	3.5%	6.2%
Thailand	-3.7%	6.2%	2.3%	4.0%
Brazil	-0.9%	2.4%	5.0%	6.1%
Total	5.6%	11.5%	4.2%	7.0%

• Source: Rabobank, 2022

Ecuador's Remarkable Solution to WSSV

- After the catastrophic WSSV outbreak of 1999, Ecuadorian farms were unable to control WSSV through biosecurity.
- A few tenacious hatcheries attempted selective breeding. It took several years to see results.
- The approach was simple. Select the best survivors from production ponds and use them as breeders in the hatchery.



Ecuador's Shrimp Performance Gains

2013

- 0.9 g/week at 10/m²
- 2 cycles/yr of 150-200 days
- 1,100– 1,400 kg/ha
- FCR 1.9-2.0

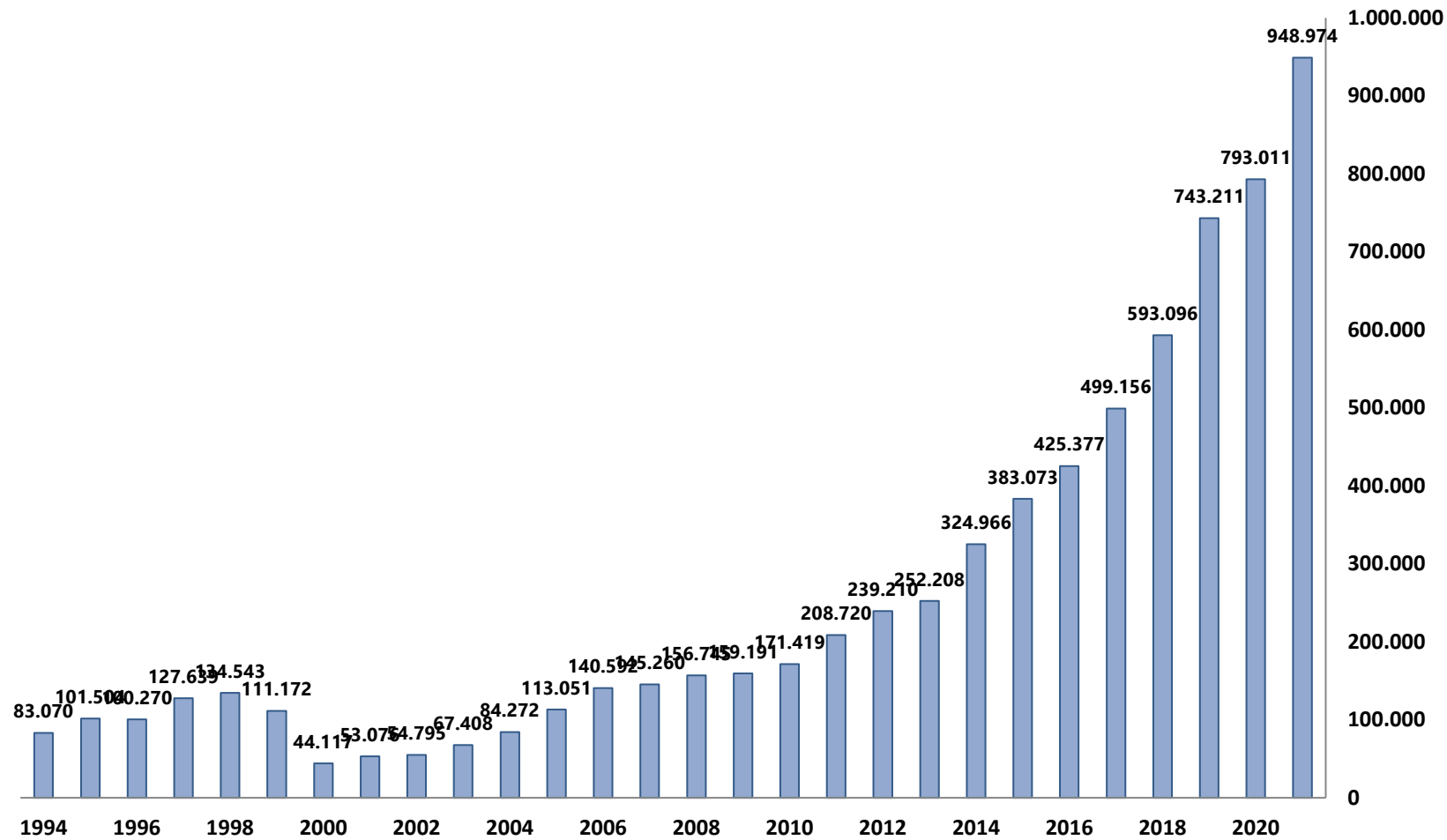
2021

- 2.0 g/week at 20/m²
- 3 cycles/yr of 100-120 days
- 3,200 – 4,100 kg/ha
- FCR 1.5-1.6



Joao Rocha, the geneticist for Ecuador's largest hatchery

Ecuador's steady growth has inspired huge investment



- Massive and sophisticated feed mills (extrusion)
- Value added processing to access the new markets



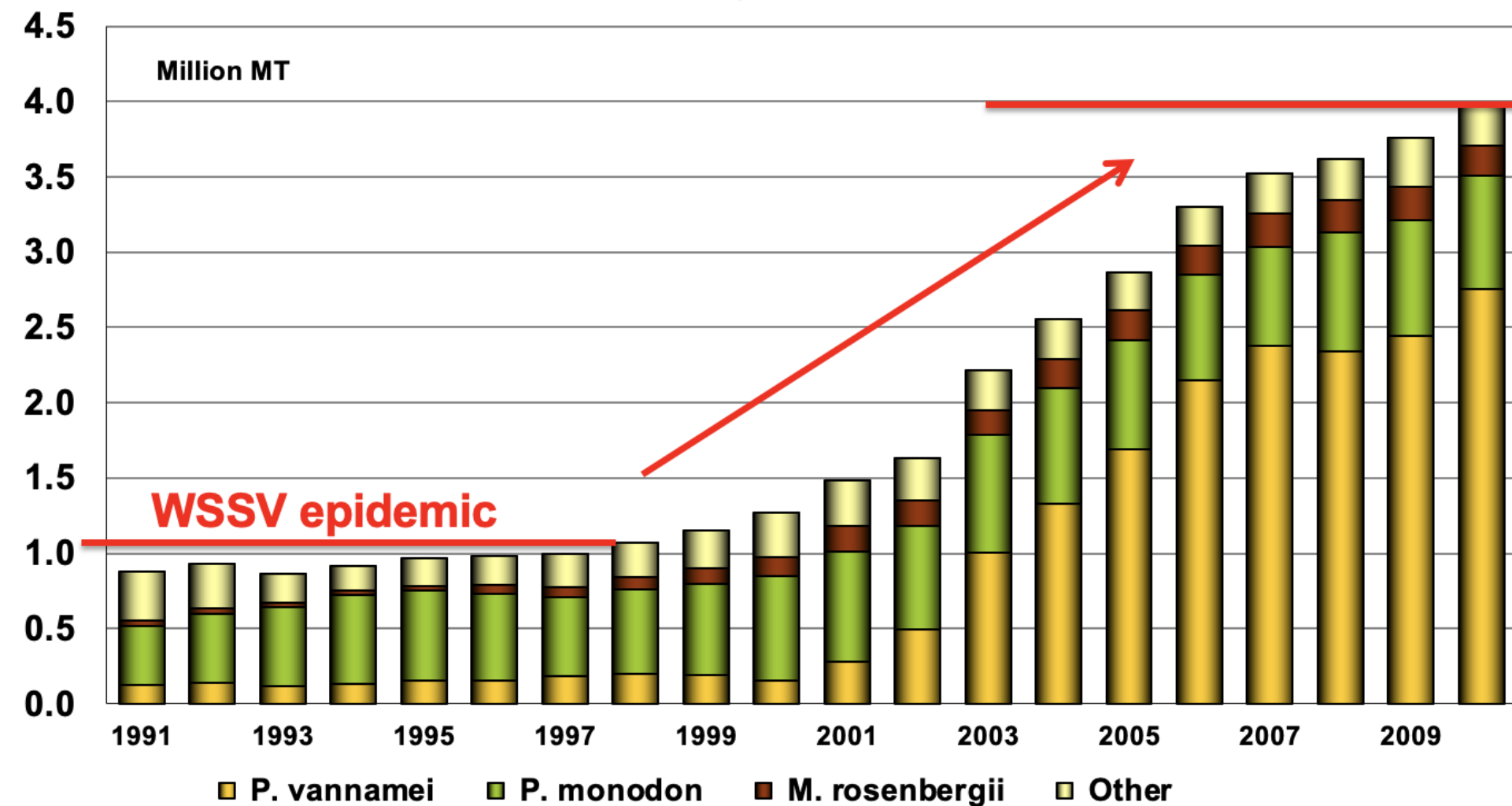
Many Improvements at Farms

- Greatly improved feeds and feeding efficiency using autofeeders
- Higher stocking densities, nursery systems, aeration, recirculation.
- Improved water quality management
- Improved bottom soil management and bioremediation protocols



Asia's Remarkable Solution to WSSV

- In 2000, SPF *L. vannamei* were introduced to Asia from breeding programs in the US.
- *L. vannamei* rapidly became the dominant global species
- By 2010, global production of shrimp had quadrupled
- Continued breeding further improved growth, disease resistance, and fecundity





Asia's increasing control, but not enough

- Basic pond designs have changed little in 40 years
 - 0.5 ha earthen, flat bottom, paddlewheel aeration
 - 5-10 mt/ha/cycle
 - Moderate biosecurity and sustainability
- Continuing challenge
 - Chronic disease issues and volatile survival



Intensive *L. vannamei* Tank Farms

- New generation of tank farms
 - Round tanks of 500-1,000 m² with steel frame and plastic liners of 1 mm
 - Stocking densities of 100-500/m²
- Strong biosecurity
- SPF broodstock bred for fast growth
- Use of automatic feeders and aeration



Minh Phu Production Data

- Nursery:
 - 230 m³ round tanks
 - Stock PL10 and harvest 1g in 30 days
- Growout
 - 1000 m³ round tanks
 - Stocking density: 300-500/m²
 - Partial harvest of 16g at 60 days and 25g at 80 days
 - Final harvest of 50 g at 110-115 days
 - 4 cycles per year
 - Yields of 200-400 mt/ha/year



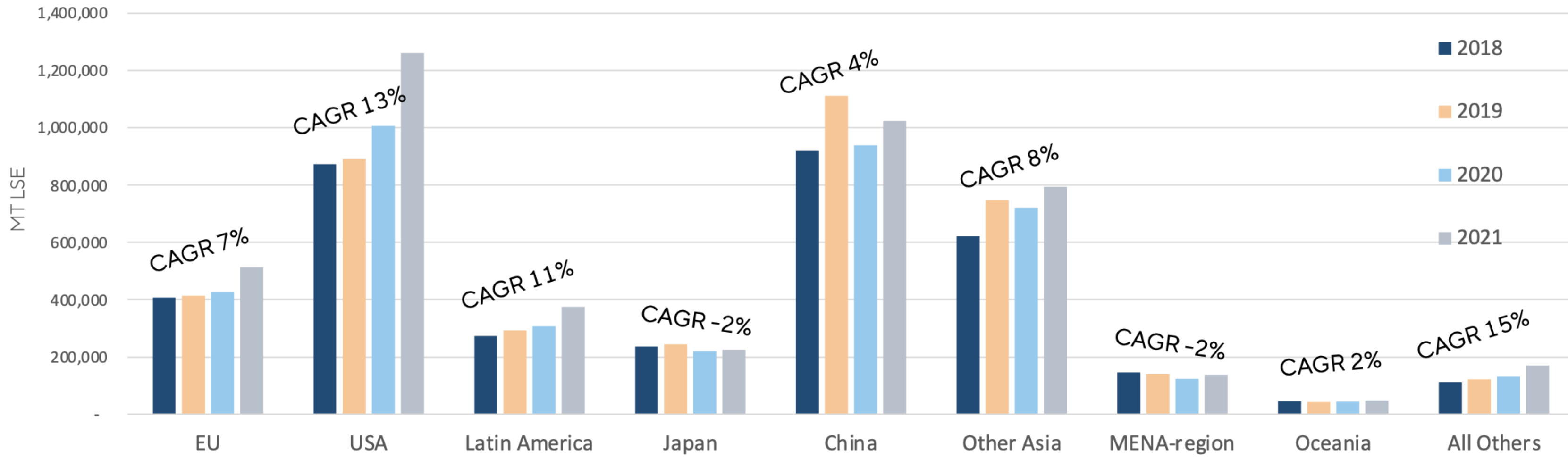
Market Trends



Market supply of farmed vannamei shrimp

Global Market of 4.58 million MT LSE growing at 7.6% ('18-'21)

Supply of farmed Vannamei (MT LSE)



Source: Kontali – Shrimp Market models

How to gain market access? Consumer Trust



AP Investigation:
Slaves may have
caught the fish you
bought

March 24, 2015

3rd party certification has become mainstream

BAP market endorser supporting four pillars of sustainability



Food Safety

Assurance that no banned antibiotics or other chemicals are used and that all approved chemical treatments are carried out in a responsible fashion.

Social Responsibility

Adherence to local laws & international norms for worker health & safety, fair labor practices and community empowerment.

Environmental Responsibility


Compliance with standards that address important issues like habitat conservation, water quality and effluent control.

Animal Health & Welfare

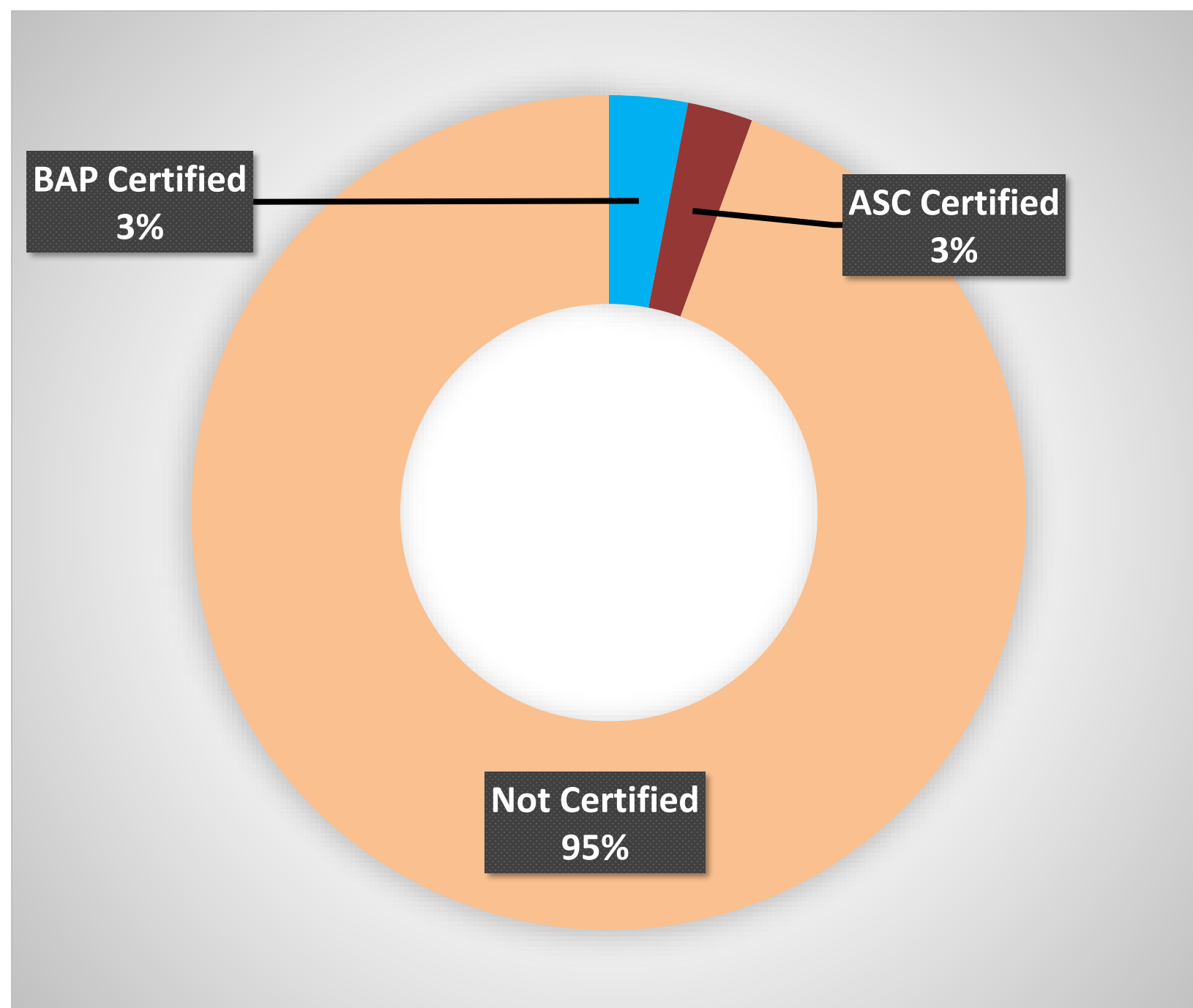
Best practices in animal husbandry, addressing issues such as disease control, stocking density & harvesting.

BAP is comprehensive, benchmarked



Principal Features			ASC	GlobalGAP	BRC
COMPREHENSIVE					
All Encompassing Standard					
	Farm	■	■	■	
	Hatchery	■			
	Feed Mill	■			
	Processing Plant	■			■
Issues Addressed					
	Environmental	■	■	■	
	Social	■	■	Add On	
	Food Safety	■		■	■
	Animal Welfare	■		■	
PROVEN					
Third Party International Benchmarking					
	Global Sustainable Seafood Initiative (GSSI)	■			
	Global Food Safety Initiative (GFSI)	■		■	■
	Global Social Compliance Programme (GSCP)	■			
TRUSTED					
	Only 100% Compliance Gains Certification/No Variances	■			Grades of Passes
	Supply Chain Transparency Technology	■			
	Robust Internal Program Integrity	■			
	Chain of Custody Verification	■	■	■	■
	Mass Balancing Verification	■	■	■	■
	Third Party Food Safety, Residue and Effluent Testing	■			
	Exclusively Seafood	■	■		

How can certification reach small farms?



- Global Farmed Seafood Volume
 - 85.3 MMT
- Only 6% is certified
 - BAP: 2.6 MMT
 - ASC: 2.2 MMT
- Small holder farmers produce 80% of the world's food supply
- The majority of aquaculture production comes from small holder farms that lie outside the reach of certification programs

Major Buyers Often Allow for AIPs

- **By 2025**, based on price, availability, quality, customer demand, and unique regulatory environments across our global retail markets, Walmart U.S., Sam's Club, Walmart Canada, Walmart Mexico, and Walmart Central America **will require all fresh and frozen, farmed and wild seafood suppliers to source from** fisheries who are:
 - Third-party certified as sustainable using Marine Stewardship Council (**MSC**) or Best Aquaculture Practices (**BAP**), or certified by a program which follows the FAO Guidelines¹ and is recognized by the Global Sustainable Seafood Initiative (**GSSI**) as such. For our farmed supply, we expect suppliers to ensure sustainable production and sourcing throughout the supply chain, **including final processing plant, farms, hatcheries and feed mills.**
 - **OR**
 - **Actively working toward certification** or in a Fishery Improvement Project (FIP) or **Aquaculture Improvement Project (AIP)** that has definitive and ambitious goals, measurable metrics, and time bound milestones.

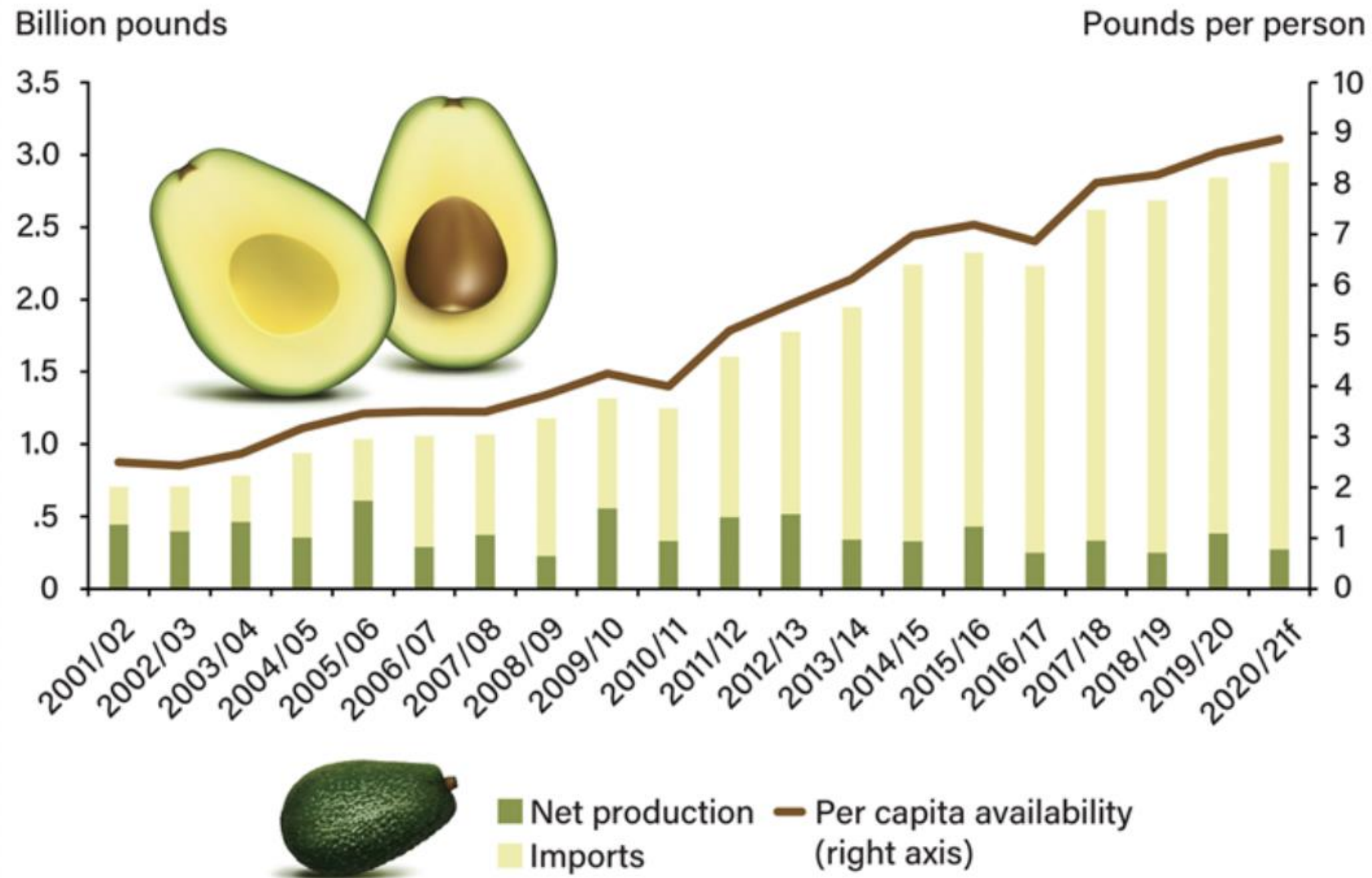
Organize farms into Clusters

Black Tiger Shrimp
from Traditional
Unfed ponds



Women-managed shrimp cluster
in Bangladesh

How to Expand Markets in a Unified Way: How can we expand the market? The Avocado Marketing Story in the US



- **Mandatory fee:** collected by USDA and managed by importers and exporters to expand markets
- **Accurate Data:** current and expected volumes from each export country
- **Quality Grading:** Inspected and graded as A, B, C

Future Challenges and Directions



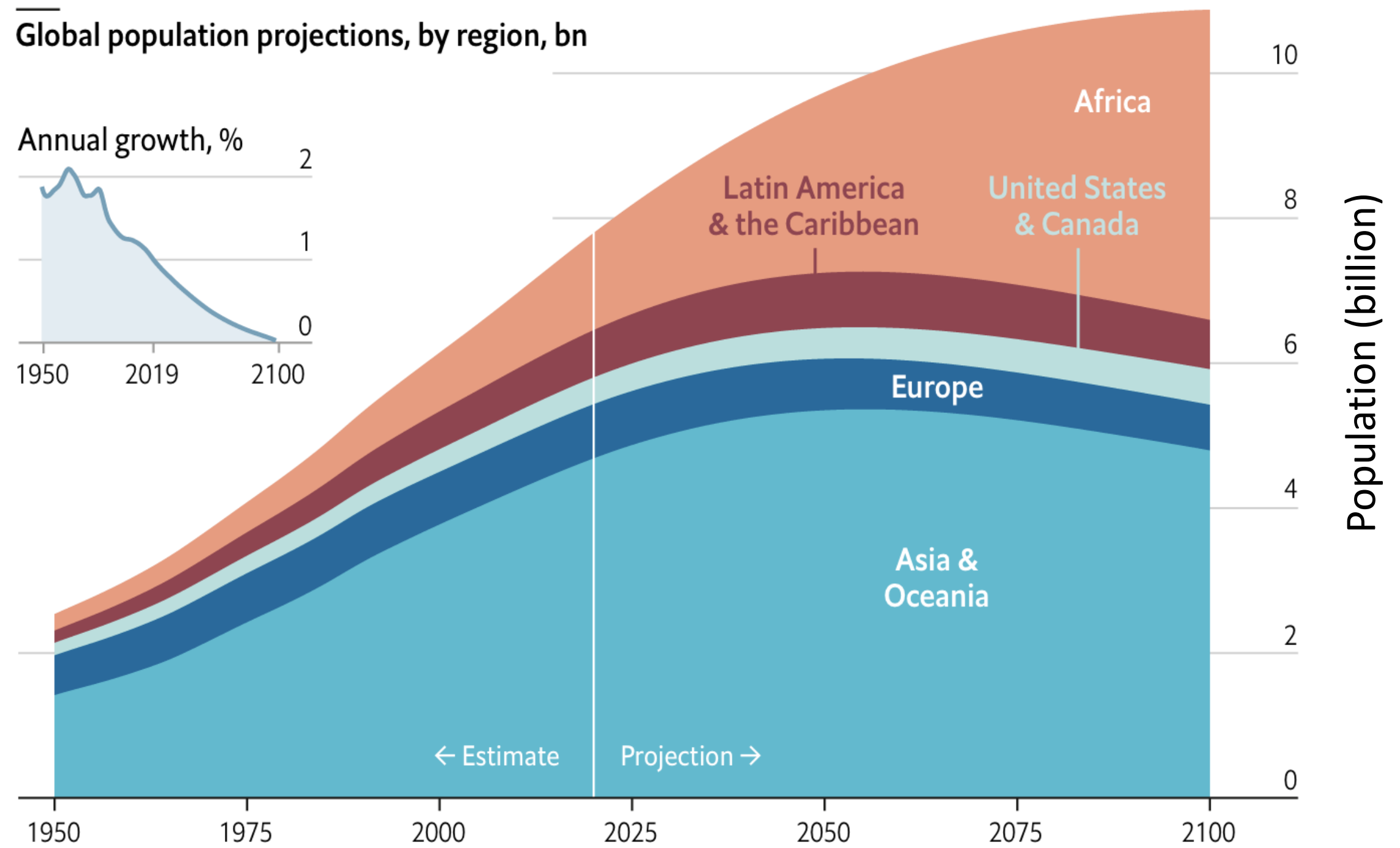
Walmart CEO, Doug McMillon

- In 2020, Walmart committed to become a Regenerative Company and achieve zero emissions by 2040
- Other major companies like Amazon, Procter & Gamble, Kroger, Apple, Google, McDonalds, Cargill, and Dannon have made similar commitments
- Producers will be expected to adapt to these stringent demands or risk losing market access.

Population and Food Demand in 2050

- Population hit 8 billion on Nov 15
- It will reach ~10 billion by 2050
- Per capita consumption is also increasing
- Food demand will increase 50%

World Population

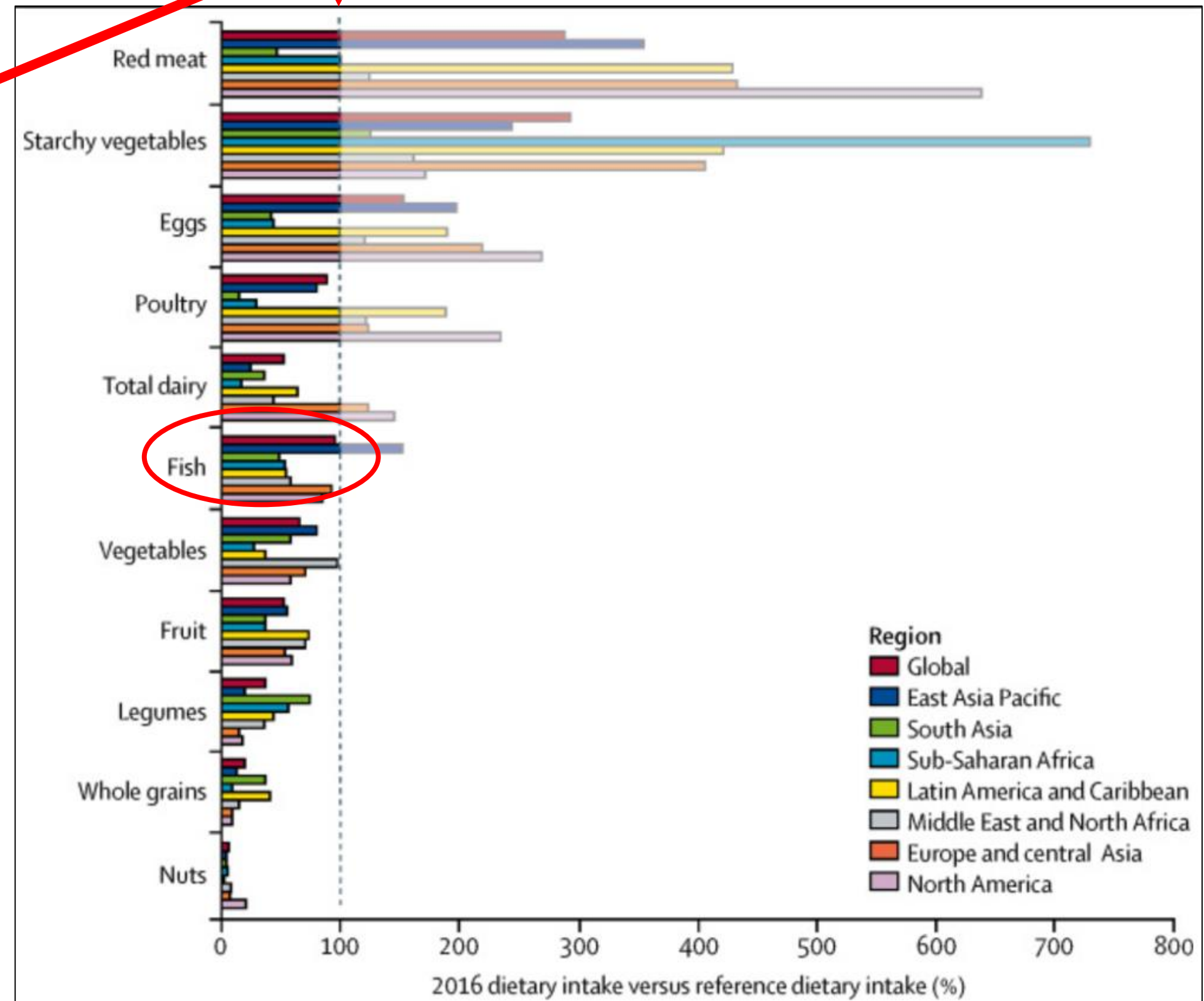


A Fundamental Food Transformation is Needed

- Food production systems already account for about 25% of global GHGe
- To increase food production 50%, we cannot simply expand existing systems without huge climate change impacts as well as:
 - Biodiversity loss
 - Soil loss
 - Habitat destruction
- A fundamental transformation is needed to produce more with less resources

Which foods will be healthy and environmentally sustainable for 10 billion people?

Gap between actual and recommended diet



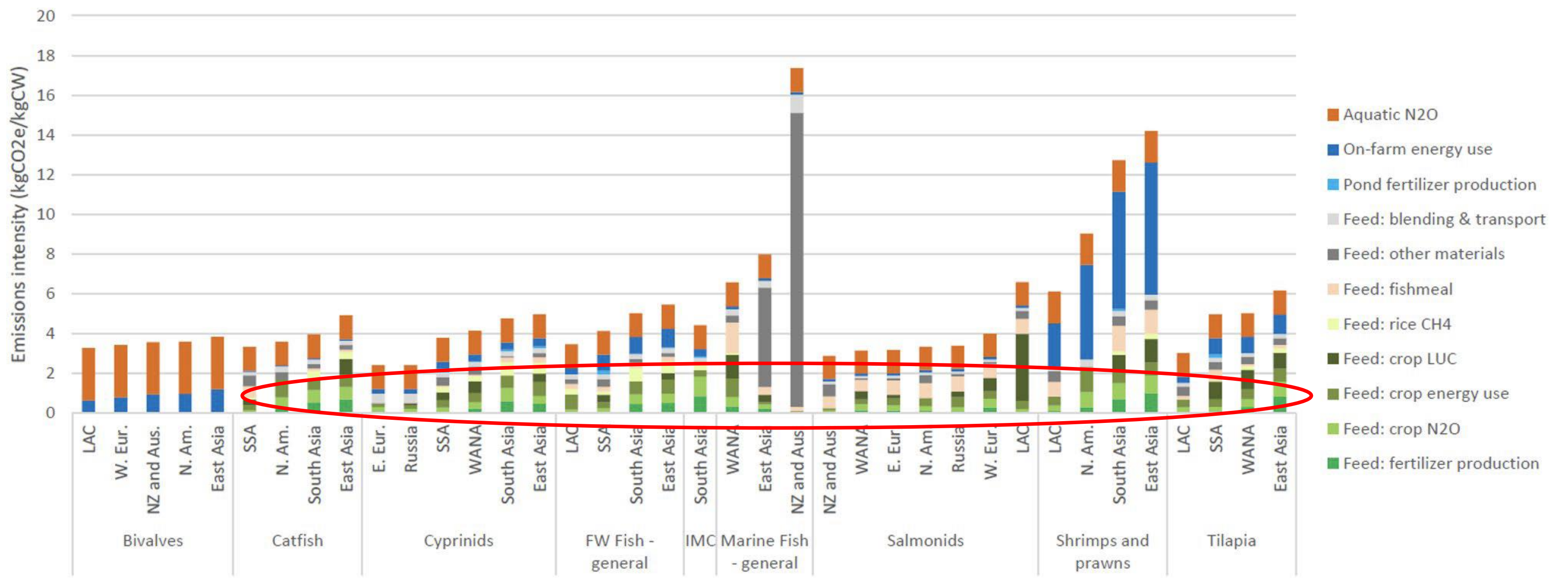
- *Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems.
- *The Lancet*, Feb 02, 2019, Vol 393, P 447-492

BAP Vanguard Standards



- Climate Action
- Sustainable Feed Ingredients
- RAS Systems
- Raised without Antibiotics
- Biosecurity Area Management

Feeds comprise over 50% of GHG emissions

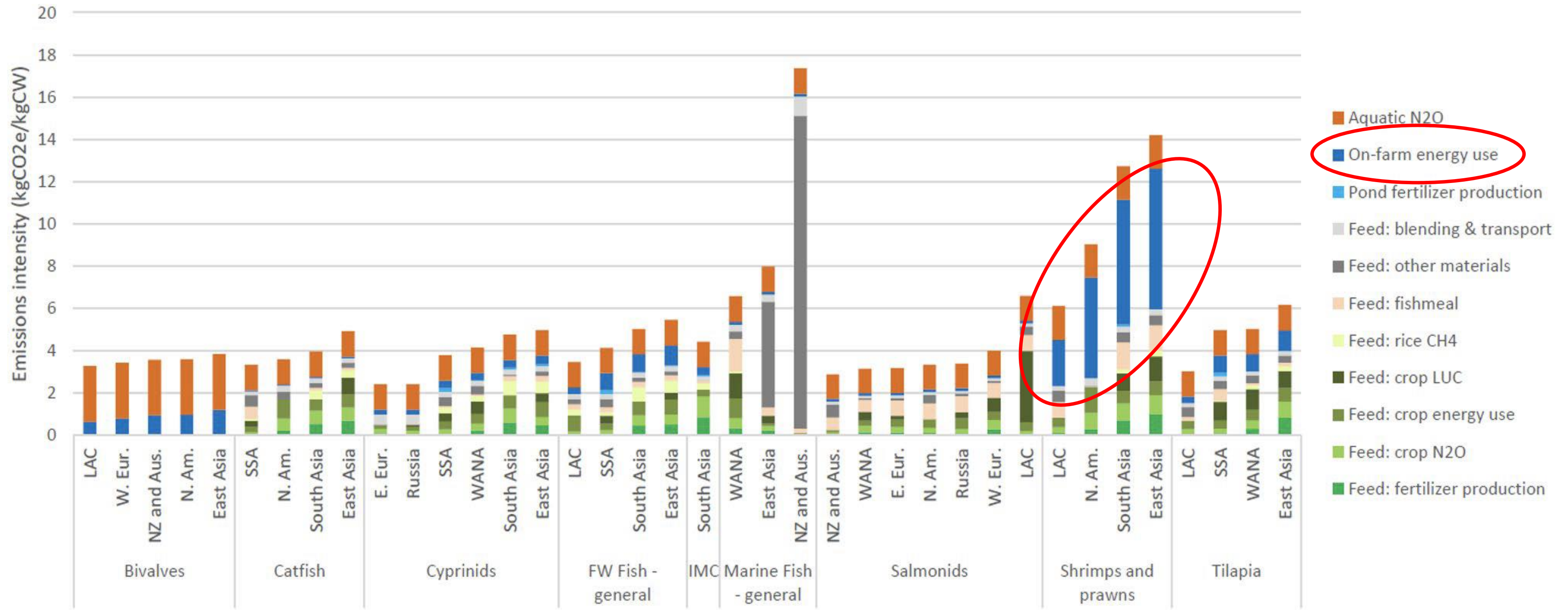


Carbon Farming and Blue Carbon Farming

- Carbon Farming
 - In 2011 Australia started a [cap-and-trade](#) program. Farmers who [sequester carbon](#) can sell [carbon credits](#) to companies in need of [carbon offsets](#)
- Blue Carbon Farming
 - Mangroves
 - Seagrasses
 - Seaweed



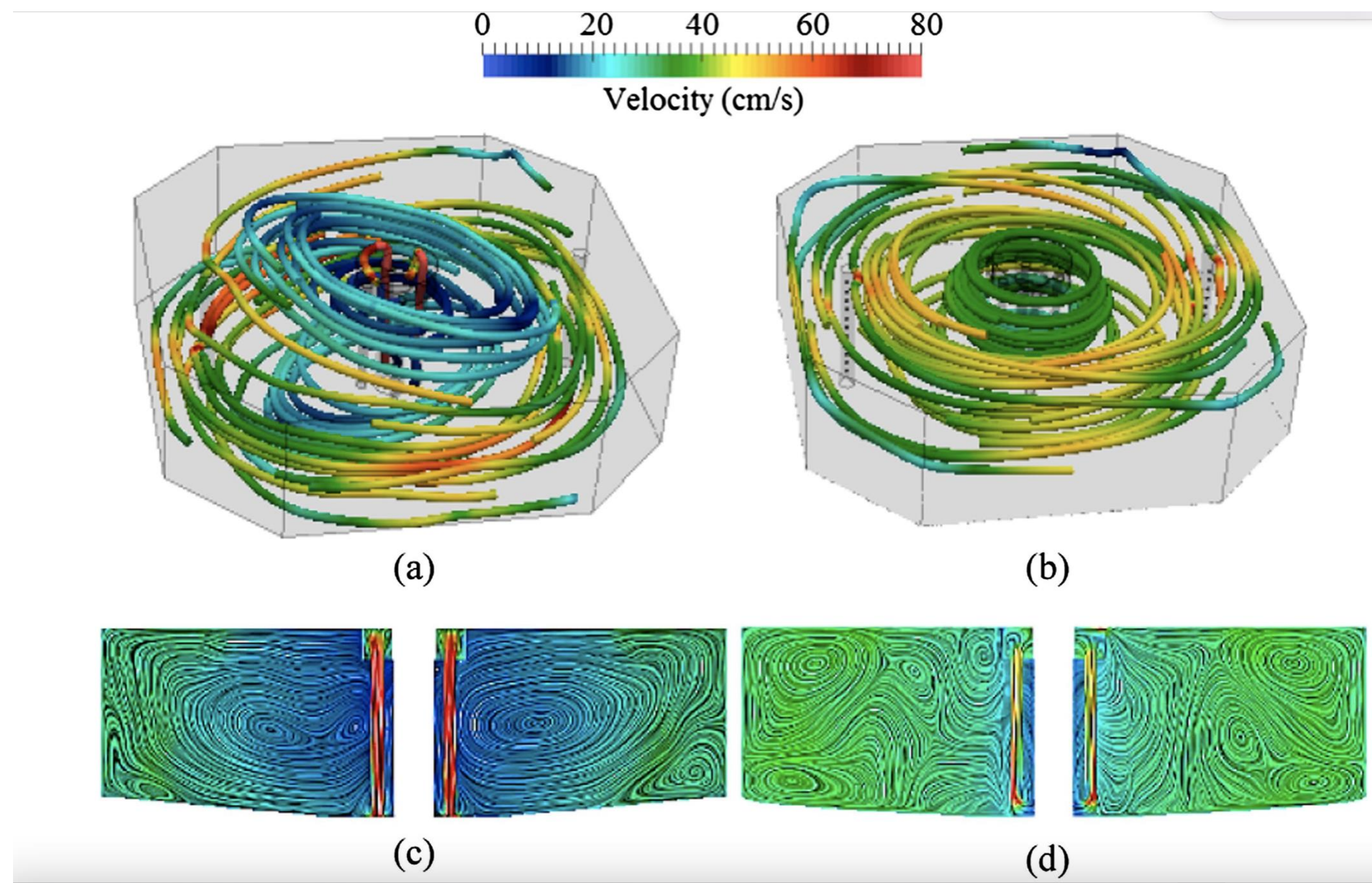
Emissions Intensity of shrimp farms



Optimizing intensive shrimp tank design

TCRS, The Nature Conservancy, and The Freshwater Institute

- Area
- Depth
- Slope
- Current velocity
- Aeration
- Lighting



Reducing Water Use and Managing Effluent

- GSA presented Innovation Award to Werner Jost, AquaScience, Brazil in 2016
 - 21 g in 116 days at 200/m²
 - Yield: 43 MT/ha
 - No discharge.** Water reused for 5 production cycles using nitrification and denitrification. Ionic balance.





Responsible Shrimp Farming Summit

HCMC, Vietnam in July 2023

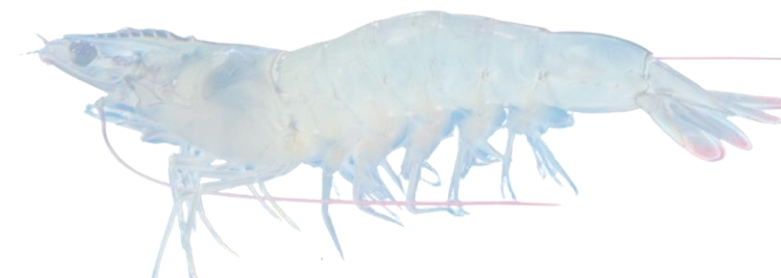


- Hybrid format
- Topics:
 - Marketing
 - Breeding
 - Carbon emissions
 - Growout optimization
 - Improver programs
 - Sustainable financing
- Tours
 - Minh Phu intensive tank farm
 - Traditional black tiger shrimp farms

Join the discussions
TCRS Community Platform
www.responsibleseafood.org

Summary

- Global shrimp production is expected to increase from 4.8 to 6.0 MMT in 2023
- Ecuador is booming, based on high survival from all-pathogen-exposed breeding
- Asia is flat and struggling with chronic diseases
- Sustainability is the key to our future and certification has become mainstream
- Food production systems must transform to increase production without worsening climate change
- Intensive tank farms are a promising new technology emerging in Asia
- Improver programs are needed to help millions of small holder shrimp farms
- Join us in person or virtually to dive deeper into these critical issues at the *Responsible Shrimp Farming Summit* in Vietnam next July





Obrigado

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