

Insights on global seaweed production and new and emerging market opportunities



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About Hatch Blue



HATCH
INVESTMENTS

HATCH Investments

Existing portfolio of 40 investments across the aquaculture and alternative seafood space. Recently closed its first round for their 2nd venture fund "Blue Revolution Fund" at a target volume of €75M.



HATCH
INNOVATION SERVICES

HATCH Innovation Services

Senior industry professionals with 65+ years combined experience providing prominent industry stakeholders with innovation scouting, market research, DD support, strategy advice, etc.



HATCH
ACCELERATOR

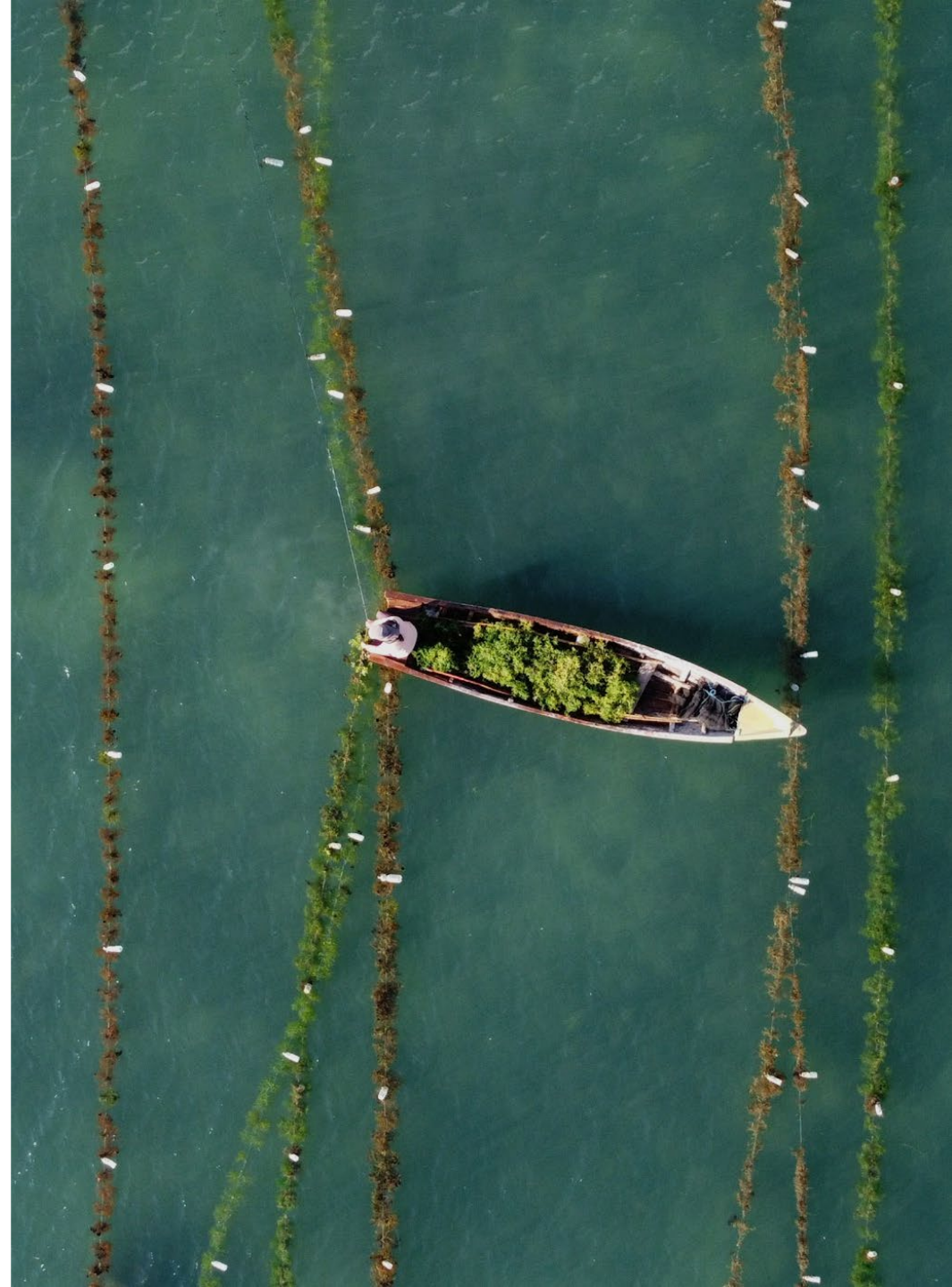
HATCH Programs

Our startup acceleration programs and incubation platform. Runs 3-5 innovation workshops for +40 startups and growth-stage companies in several countries annually. Receiving more than +350 aquaculture-specific applications per year.



The Fish Site

The largest global digital aquaculture-news platform, in-house intelligence, and Media Agency.

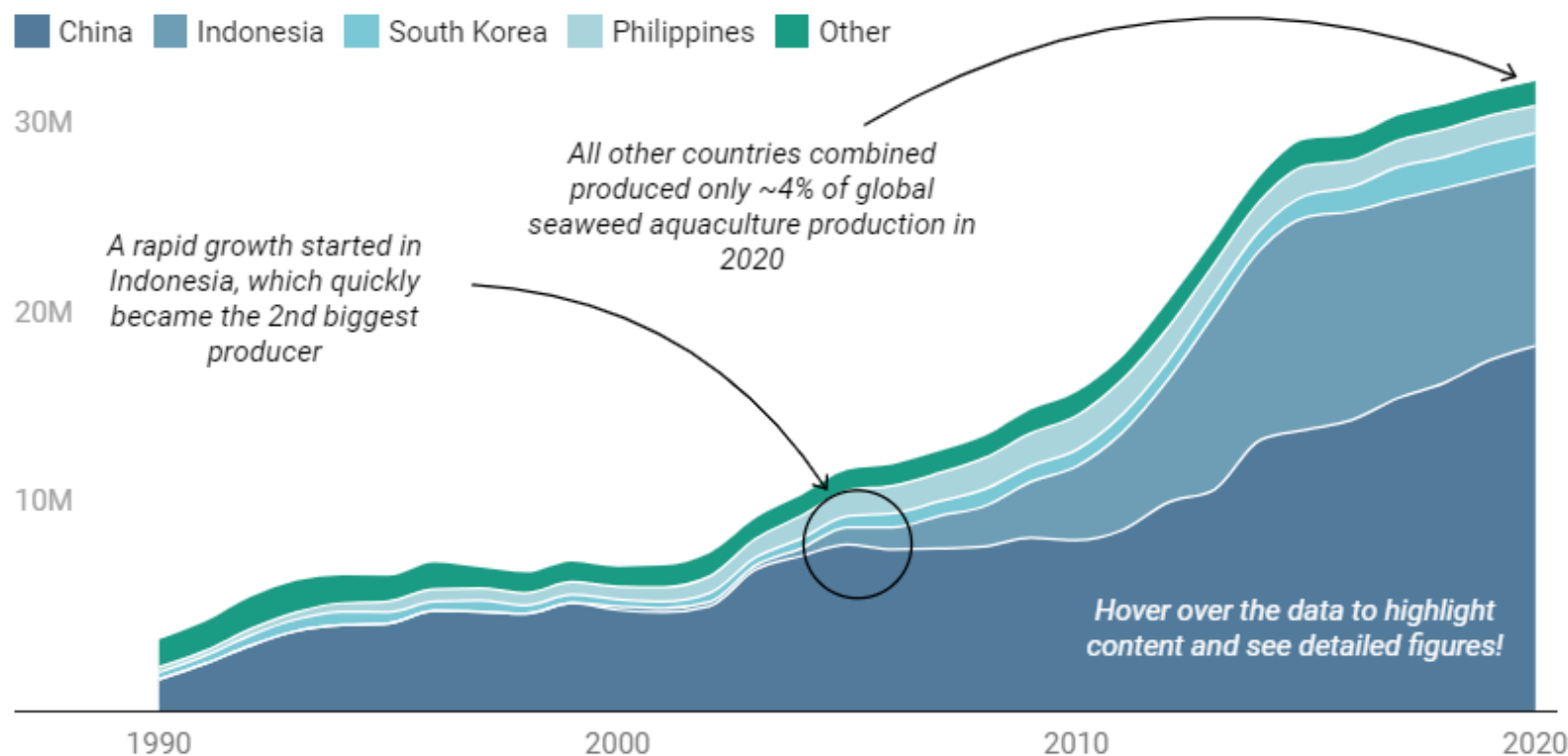


Hatch global seaweed insights

In 2022 we conducted an in-field survey with insights from 100+ seaweed farmers and interviews across the major seaweed producing regions in Southeast Asia region.

Global Seaweed Production Volumes 1990-2020 (in Tonnes Wet Weight)

Most of the seaweed produced globally comes from a handful of countries with **China and Indonesia** producing the biggest volumes. Following them are mainly **other Asian countries** based on the 2020 figures.



Dive into our data

*The analysis INCLUDES ONLY Saccharina, Eucheumatoids, Gracilaria, Pyropia, Undaria species groups

Chart: Hatch Innovation Services • Source: [FAO Fisheries and Aquaculture](#) • Created with [Datawrapper](#)

Hatch global seaweed insights

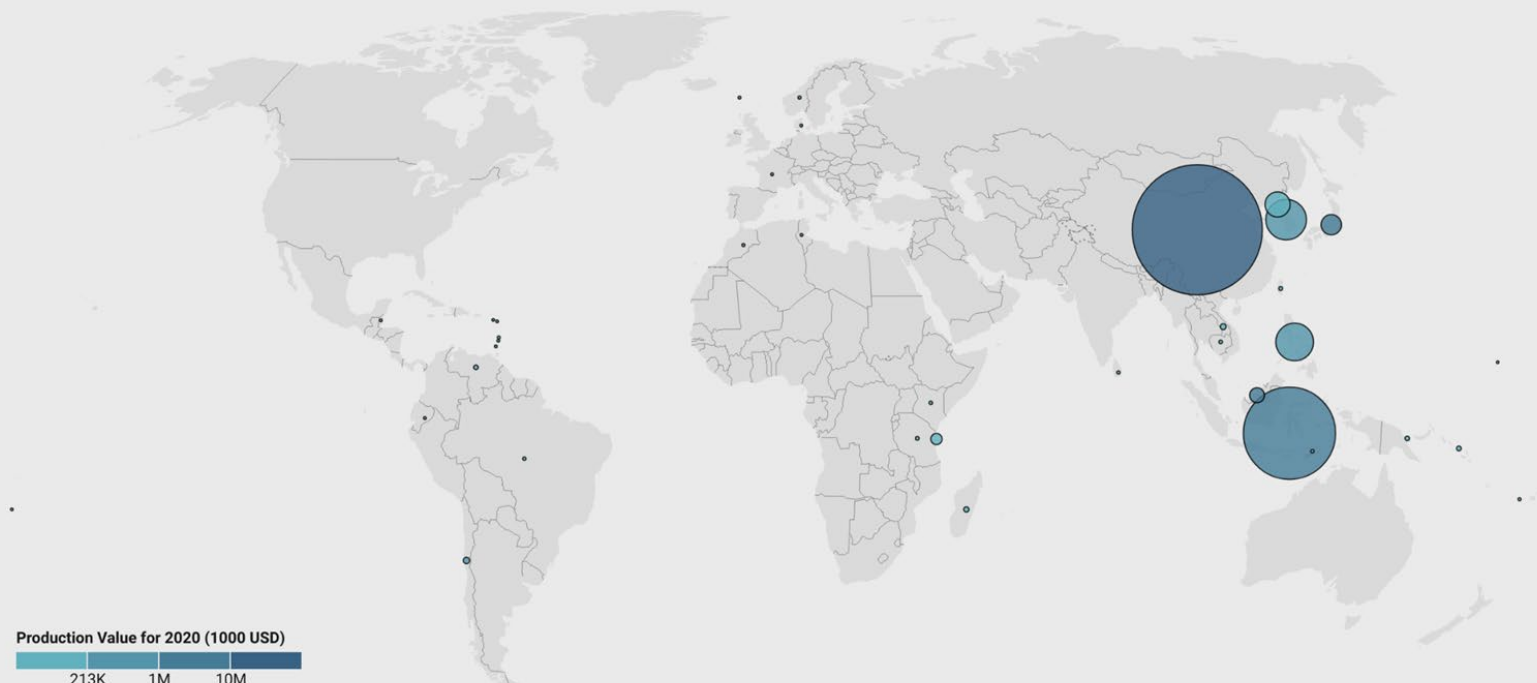
We used this data to create one of the most comprehensive data platforms on seaweed industry data that allows us to provide deep sector insights around market and investment opportunities.

We combine our data platform and industry sector expertise with our market research to provide our clients with the most up-to-date market information.

Dive into our data

Map of Global Seaweed Production Volume (in Tonnes Wet Weight) and Value (in 1000 USD) in 2020

The global seaweed production is highly dependent on a small number of **East and South-East Asian nations**. Both in terms of volumes and values, Asian producers are dominating the seaweed market. The other continents' production volumes are dwarfed by the volumes of countries such as **China or Indonesia**.

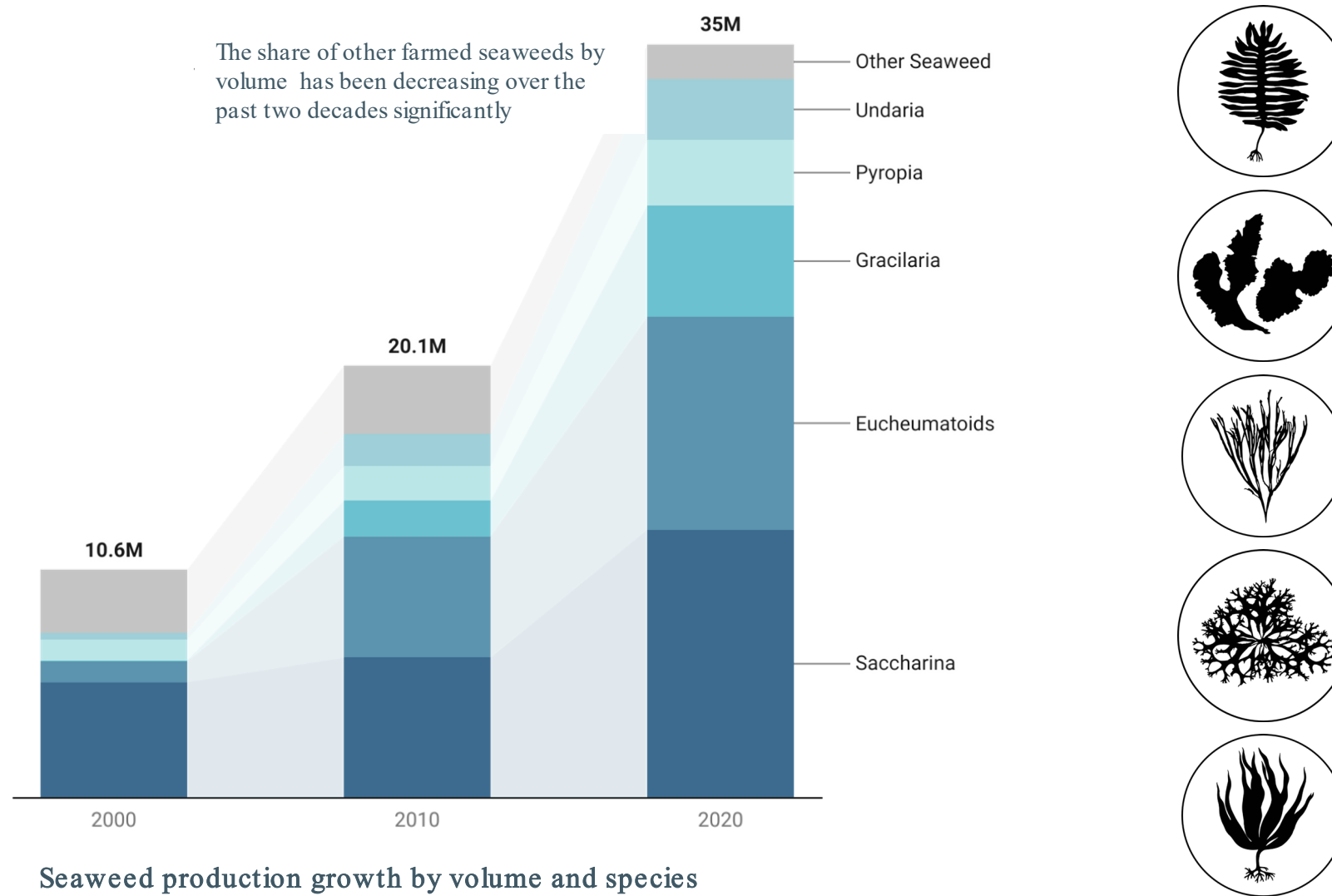


*The analysis INCLUDES ONLY *Saccharina*, *Eucheumatoids*, *Gracilaria*, *Pyropia*, *Undaria* species groups

Map: Hatch Innovation Services • Source: FAO Fisheries and Aquaculture • Created with Datawrapper

95% of global seaweed production is based on only 5 species varieties

- although more than 12,000 species have been described to date

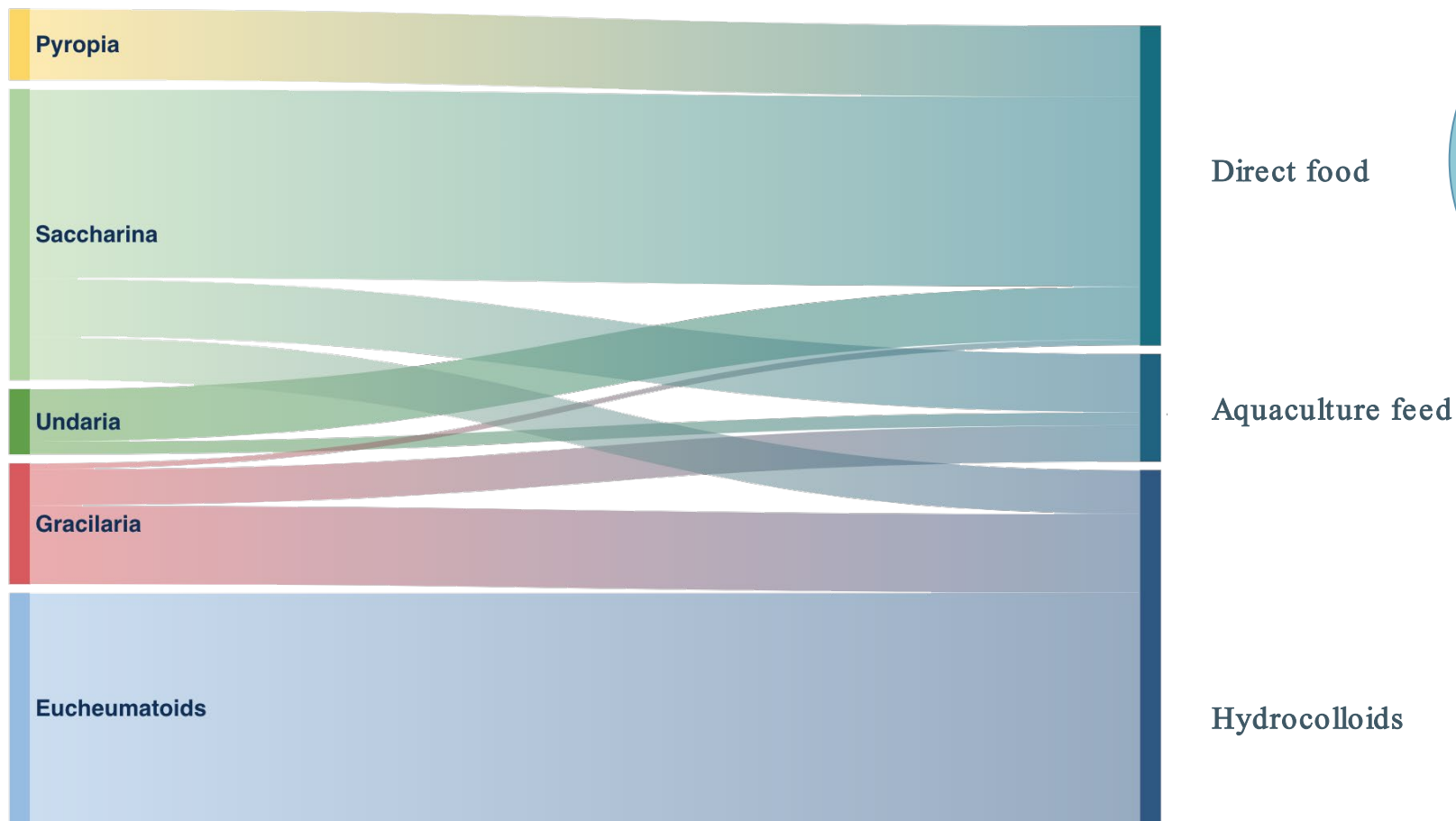


Seaweed production growth by volume and species

Based on annual figures between 2000-2020 provided by FAO Fisheries and Aquaculture (volume in tonnes wet weight)

Current seaweed markets

Most cold-water species go directly to human consumptions; most warm-water species go toward the hydrocolloids markets














The potential for providing large quantities of food and biomass from seaweed mariculture is much larger than for any other group of marine organisms (SAPEA, 2017)

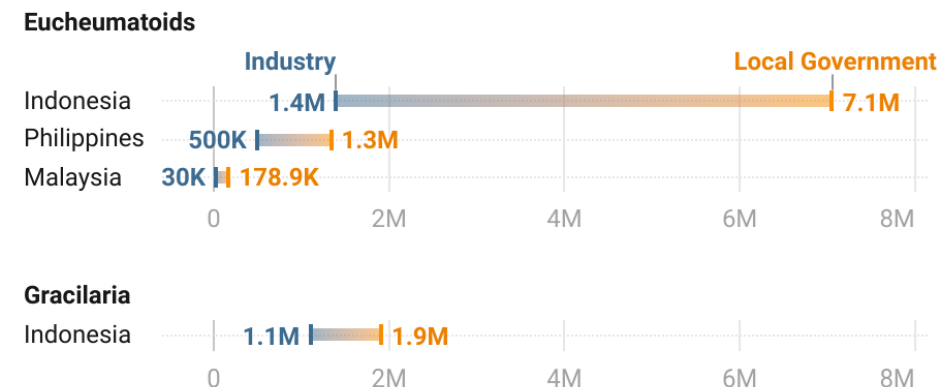
Disclaimer: This is just on the basis of the field insights - therefore only data from the 6 countries studied - which account for 98% of global farmed seaweed according to FAO 2020 data

Significant production data issues exists

Global seaweed production is much lower than official statistics suggest resulting in (future) overcapacity in the processing sector in existing markets

Country		 Undaria	 Saccharina	 Pyropia	 Gracilaria	 Eucheumatoids
South Korea		Realistic	Realistic	Realistic		
Japan		Realistic	Realistic	Realistic		
China		Inconsistent	Inconsistent	Realistic	Inconsistent	Unknown
Indonesia					Inconsistent	Inconsistent
Philippines						Inconsistent
Malaysia						Inconsistent

Industry estimates vs. government data on production volumes in tonnes wet weight



Sources of Official Production Data

- South Korea.....Korea National Statistical Office (Fishery production survey)
- Japan.....Ministry of Agriculture and Forestry of Japan (Census of Fisheries)
- China.....China Fishery Statistical Yearbook
- Indonesia.....Ministry of Marine Affairs and Fisheries (DKP)
- Philippines.....Philippine Statistics Authority (PSA) (Fisheries Statistics Division)
- Malaysia.....Department of Fisheries

Disclaimer: The industry estimates are on the basis of interviews with exporters, processors and independent industry experts - therefore only data from the 6 countries studied

Farmer's main challenges and wishlist

Farm-level data helps to inform where research, innovation and investment is needed

Saccharina farms

	Ranking	South Korea	Japan	China
Farm Challenges	1	Bottleneck in drying capacity	No added value on kombu	Changing ocean environment
	2	Changing ocean environment	Low water exchange	Physically hard work
	3	Labour shortage	Ageing farmer population	Rising labour cost
	4	Nutrient deficiencies	Natural predators (grazers)	High production cost
Farm Wishlist	1	Dryer with higher capacity and lower energy use	Better prices	Automating the harvest
	2	Automating the thinning out work	Young generation willing to continue	Automating the deployment process
	3	Climate change resistant cultivars	Larger harvesting boat	Efficient indoor drying capacities
	4	Technology to farm further off shore	New drying rooms	Automating the thinning out work

Based on 14 interviews conducted across 4 major producing regions in 3 countries

Eucheumatoids farms

	Ranking	Indonesia	Philippines	Malaysia
Farm Challenges	1	Lack of (quality) seedlings	Lack of (quality) seedlings	Poor market access
	2	Lack of drying facilities / space	Poor access to capital	Lack of (quality) seedlings
	3	Poor access to capital	Extreme weather events	Poor access to capital
	4	Filamentous algae (seasonal)	Lack of drying facilities / space	Natural predators (grazers)
	5	Ice-ice syndrome (seasonal)	Poor market access	Ice-ice syndrome (seasonal)
	6	Strong price fluctuations	Strong price fluctuations	Filamentous algae (seasonal)
Farm Wishlist	1	Space to expand	Drying platform	High quality seedlings
	2	Boat with engine	Boat with engine	Access to more buyers
	3	Materials to expand	Materials to expand	Better prices
	4	Drying platform	Storage facility	Materials to expand
	5	High quality seedlings	Access to high quality seedling	Drying platform

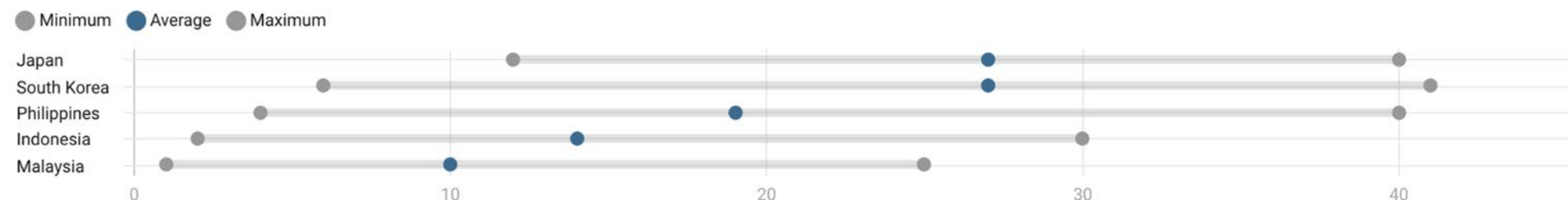
Based on 66 interviews conducted across 7 major producing regions in 3 countries

Socio-Demographic seaweed data

A generational transition is underway in some regions, resulting in fewer seaweed farmers. Therefore, it would be imperative to strengthen and develop the next generation of tech-driven seaweed aquaculture farmers to ensure the industry's crucial role in SEA cultures.

The farmers typically had +10 years of seaweed farming experience

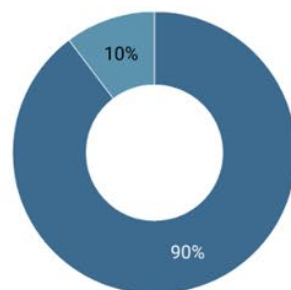
Time farmer has been farming seaweed based on 94 interviews conducted across 15 major producing regions in 5 countries



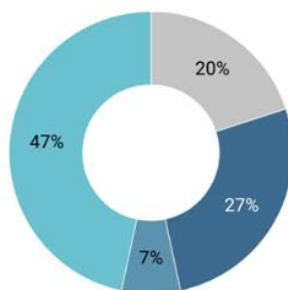
Seaweed farming is passed on between generations within a family

Generation of farmer based on 94 interviews conducted across 15 major producing regions in 5 countries

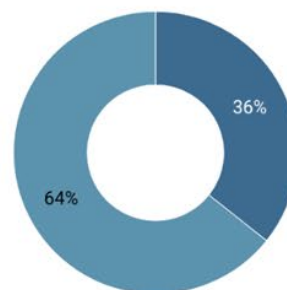
Legend: No Info (Grey), 1st (Dark Blue), 2nd (Medium Blue), 3rd (Light Blue)



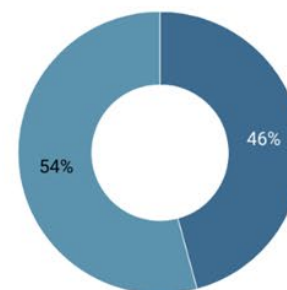
Indonesia



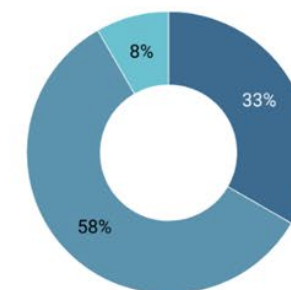
Japan



Malaysia



Philippines



South Korea

Seaweed Investments

Between 2020-2022 investments in the seaweed sector were primarily focus on product development.

Number of Deals by Category between 2020 and 2022

Product Development



Farming & harvesting



Processing



Infrastructure & equipment



Research



Monitoring tech



Distribution



Consulting



Conservation & restoration



Breeding & propagation



Current venture capital investment concentrated in Europe and North America.

Seaweed Investments by Geography between 2020 and 2022



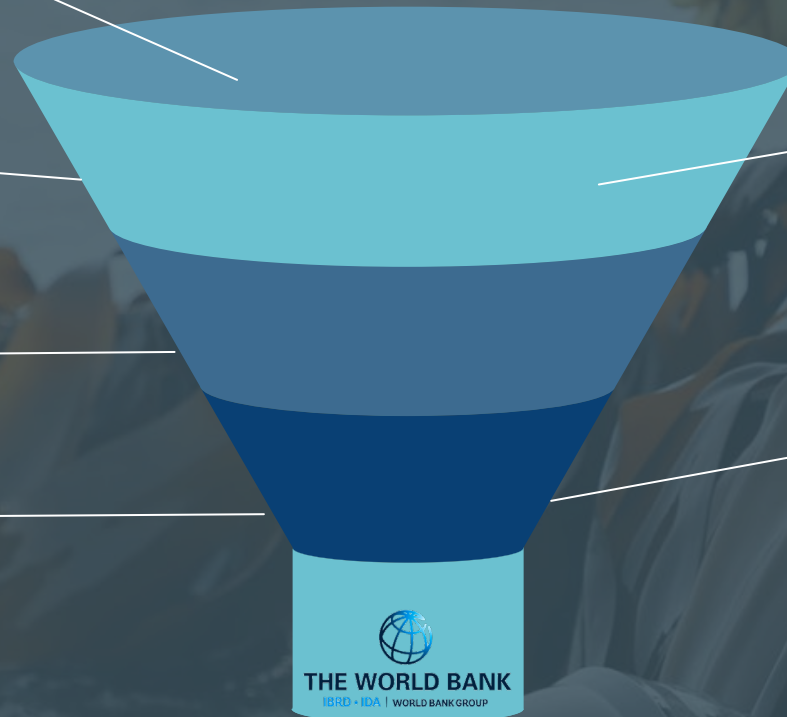
We recently analysed 10 emerging seaweed markets and ecosystem services

We took ±120 applications of seaweed

Ran a **prioritization** screen to find our shortlist

Decided on **10 sectors** for further evaluation

That we will apply our **market forecasting model** to



Based on

- Market Growth Data
- Environmental impact
- Socio-economic impact
- Expert input

Using

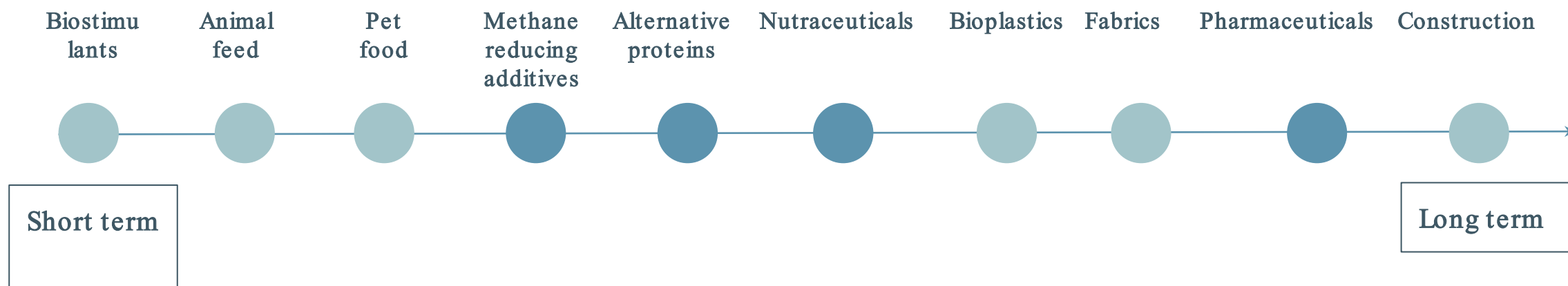
- Market data
- Grey literature
- Scientific literature
- 130 + Stakeholder interviews with:
 - Innovators
 - Corporations
 - Experts

New and Emerging Global Seaweed Markets

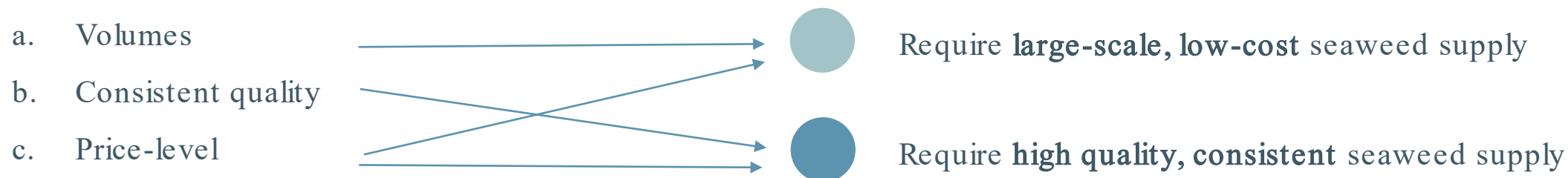
a Report commissioned and published by the World Bank Group

High level overview of market maturity for new and emerging seaweed applications

Biostimulants, pet food and feed additives are most promising short-term markets

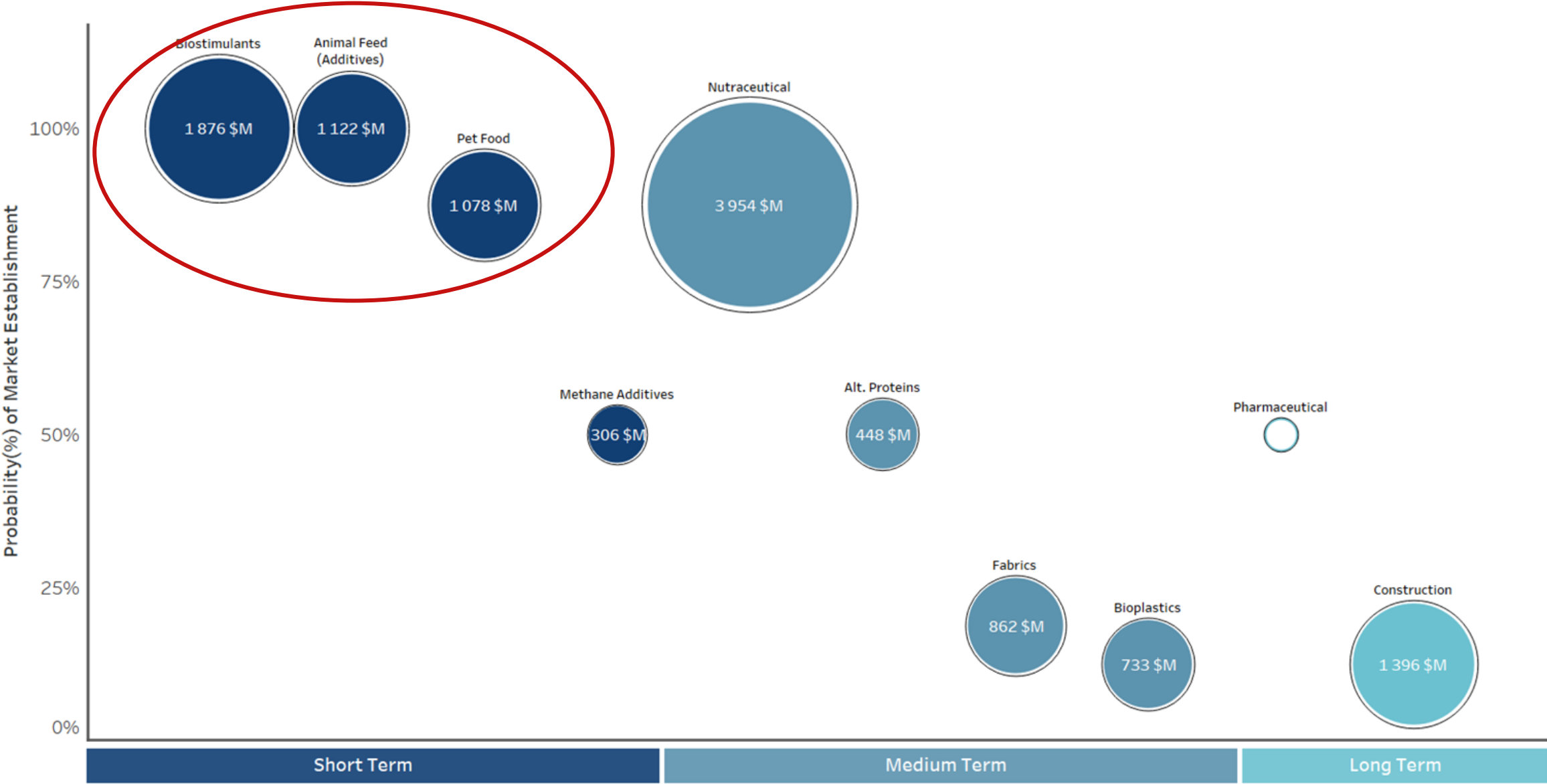


Availability of raw material (seaweed) is a major challenge



Potential Applications of Seaweed by Time Horizon, Predicted Market Size by 2030 (\$M) and Probability of Market Establishment

Future Market Size
 ● Estimation Available ○ No Estimation



Animal feed additives



Global feed additive market: \$38.86 billion



Projected market growth: 3.9 % CAGR between 2022-2030



- Key drivers:**
- Increasing public concerns about meat quality and safety, outbreaks of livestock diseases
 - Customers turn to natural alternatives to synthetic products
 - Economic incentives for farmers (productivity gains, improve feed conversion ratios, better overall health reduces need for antibiotics)
 - Costs of seaweed-based products are already competitive with other feed additives



Outlook: Seaweed-derived feed additives are expected to outpace other applications over the next five years. Improvements in feed conversion ratios are especially promising.



Seaweed-based feed additive & feed ingredient exist, but no data on market size is available



Projected seaweed-based feed additives market: \$1.122 billion



- Key challenges:**
- Availability of sufficient volumes of seaweed
 - Customer onboarding and demonstrating results through large-scale trials

The state of the global seaweed industry - key takeaways

Seaweed supply:

Significant progress in both **established and new seaweed** farming regions is needed.

- Breeding programs
- Automation of farm processes
- Legislative incentives
- Access to financial services
- Capacity building

Supported by, more knowledge sharing and joint development across established and new seaweed farming regions.

A clean, resilient and inclusive seaweed industry at scale

Potential markets:

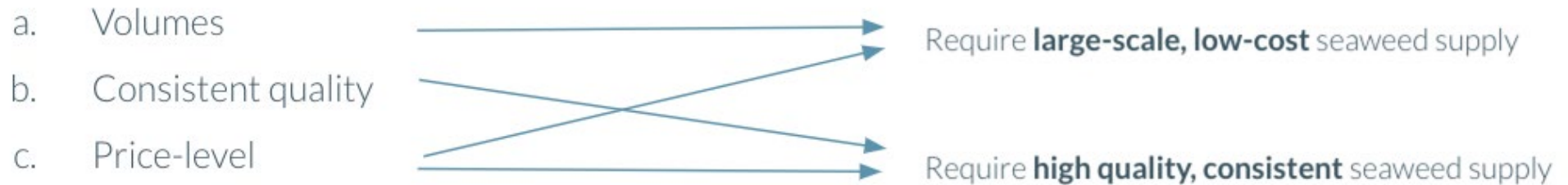
Novel and diverse products and applications from seaweed biomass have **technically been proven**.

To get them to market, they need:

- Consistent raw material supply at required scale + price (and quality)
- Access to long-term, low-cost capital
- Standardized environmental impact assessments
- Legislative incentives
- Social awareness and acceptance
- Biorefinery technology

Major challenges across all market categories

- Supply constraints globally and high price volatility



- Perishability at harvest - needs to be made shelf stable and limitations with current methods (drying, fermentation,..)
- Lack of data that provides evidence for sustainability claims of seaweed production and based products
- Unclear regulatory environment for different applications
- Competition between seaweed-based product categories

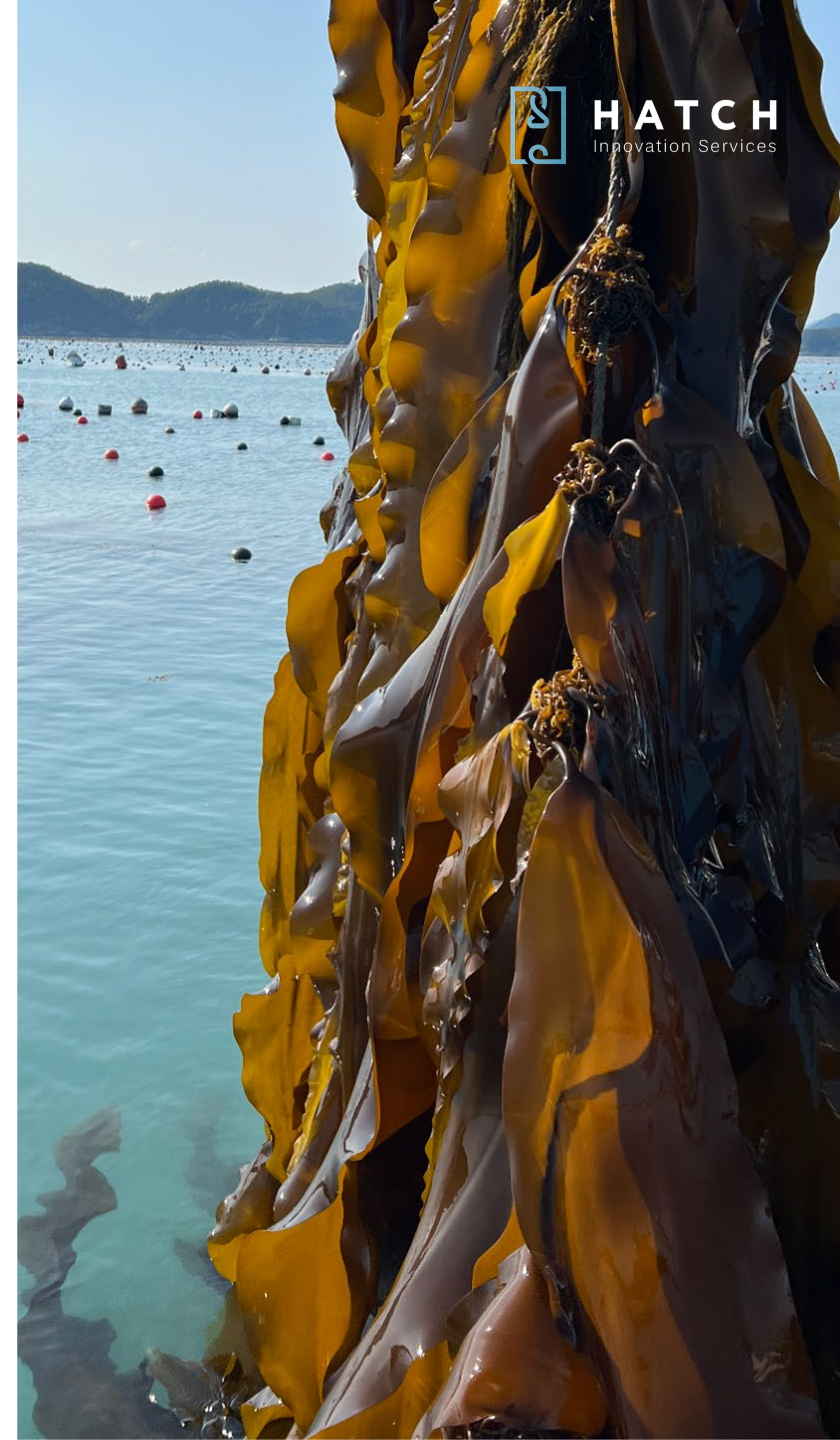
Main challenges for new and emerging markets:

1. Raw material availability is a major constraint to the development of new seaweed markets
1. Large volumes will continue to come from Asia in the near future, but output is also declining here
1. Difficult for external companies to tap into existing supply chains in Asia

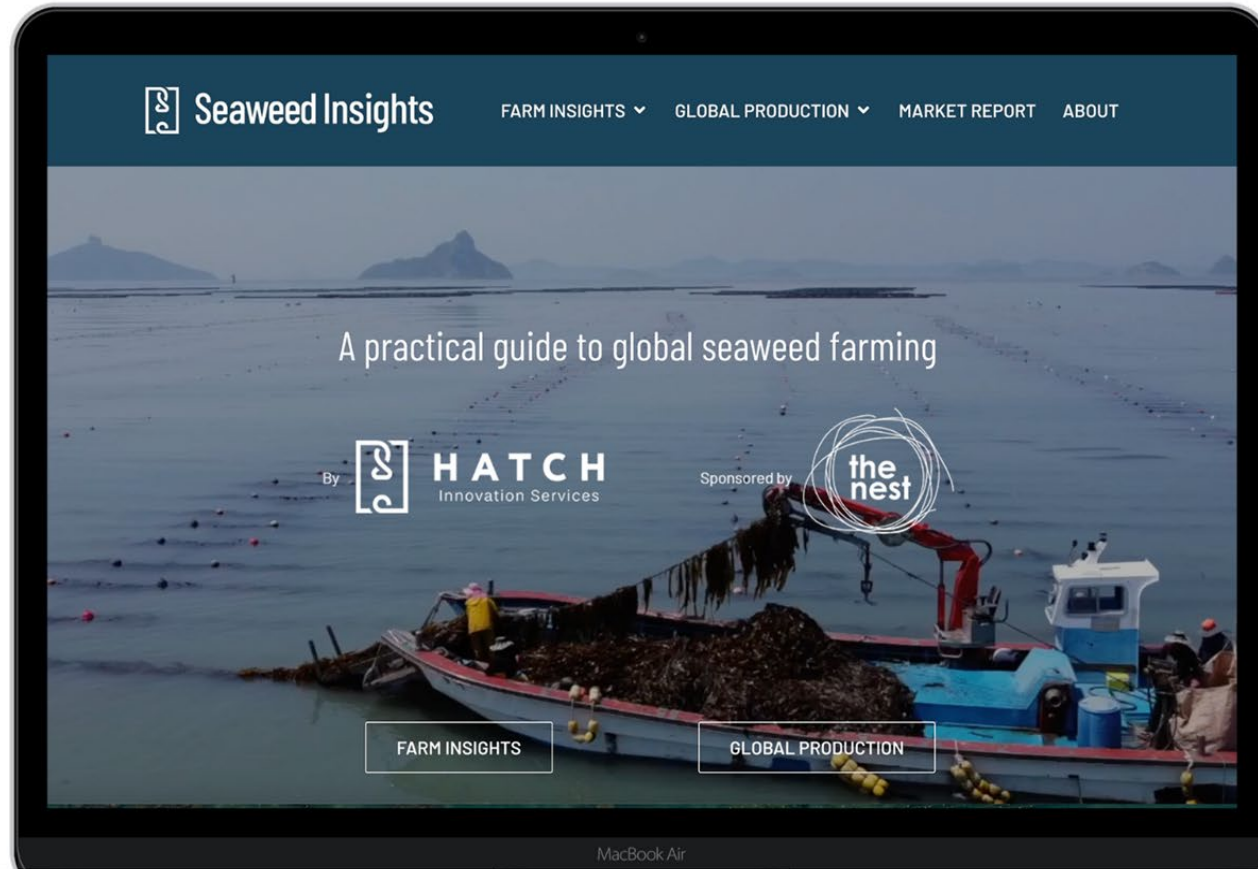
→ Need for increased knowledge sharing and joint development across established and new seaweed sectors

Key learnings

1. Supply constraints also in Asia and high price volatility
2. Biorefineries are critical for the development of further seaweed applications and co-products
3. Vertical integration is key to control supply volumes & quality (eg upstream through breeding programs) and capture margins
4. Pet food, feed additives and biostimulants are most promising short-term markets



For more information, visit our Seaweed Insights



- Global production analysis
- Full suite of farm level data from 100+ farm visits
- 6 countries that produce 98% of global seaweed volume
- 5 species groups that account for 97 % of global production
- 10 Supply chain deep dives for main current market applications



OVERVIEW



EUCHEUMATOIDS



SACCHARINA



UNDARIA



PYROPIA



GRACILARIA



HATCH

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