

Seaweed Biostimulants

Unlocking the potential of seaweed
biostimulants in agriculture for plant, soil,
and marine benefits

Seagriculture, 17th June 2026

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An underwater photograph showing a dense field of brown seaweed with long, thin blades. A bright yellow, teardrop-shaped float is attached to one of the seaweed stalks. The background is a deep blue, slightly hazy water. The text "Why does Hatch Blue care about seaweed supply chains?" is overlaid in white, bold, sans-serif font.

Why does Hatch Blue care about seaweed supply chains?



HATCH
BLUE

Hatch Blue is a specialized investment company dedicated to supporting sustainable aquaculture and creating healthier oceans.

Vision

A climate-smart, truly sustainable and just (sea)food transition.

Mission

To catalyze an innovative (sea)food industry and scale impactful businesses through knowledge, investment and ecosystem building.

Hatch Blue Overview

Investments

Existing portfolio of 65+ investments across the aquaculture and alternative seafood space, **with + €128M of aum.**



Program

Running 3-5 innovation workshops annually for +40 startups and growth-stage companies globally. More than **+350 aquaculture-specific apply annually**



Consulting

70+yr ccombined xp supporting industry stakeholders with innovation scouting, market research, DD support, strategy advice.



Media

The largest global digital aquaculture-news platform, in-house intelligence, and media agency.



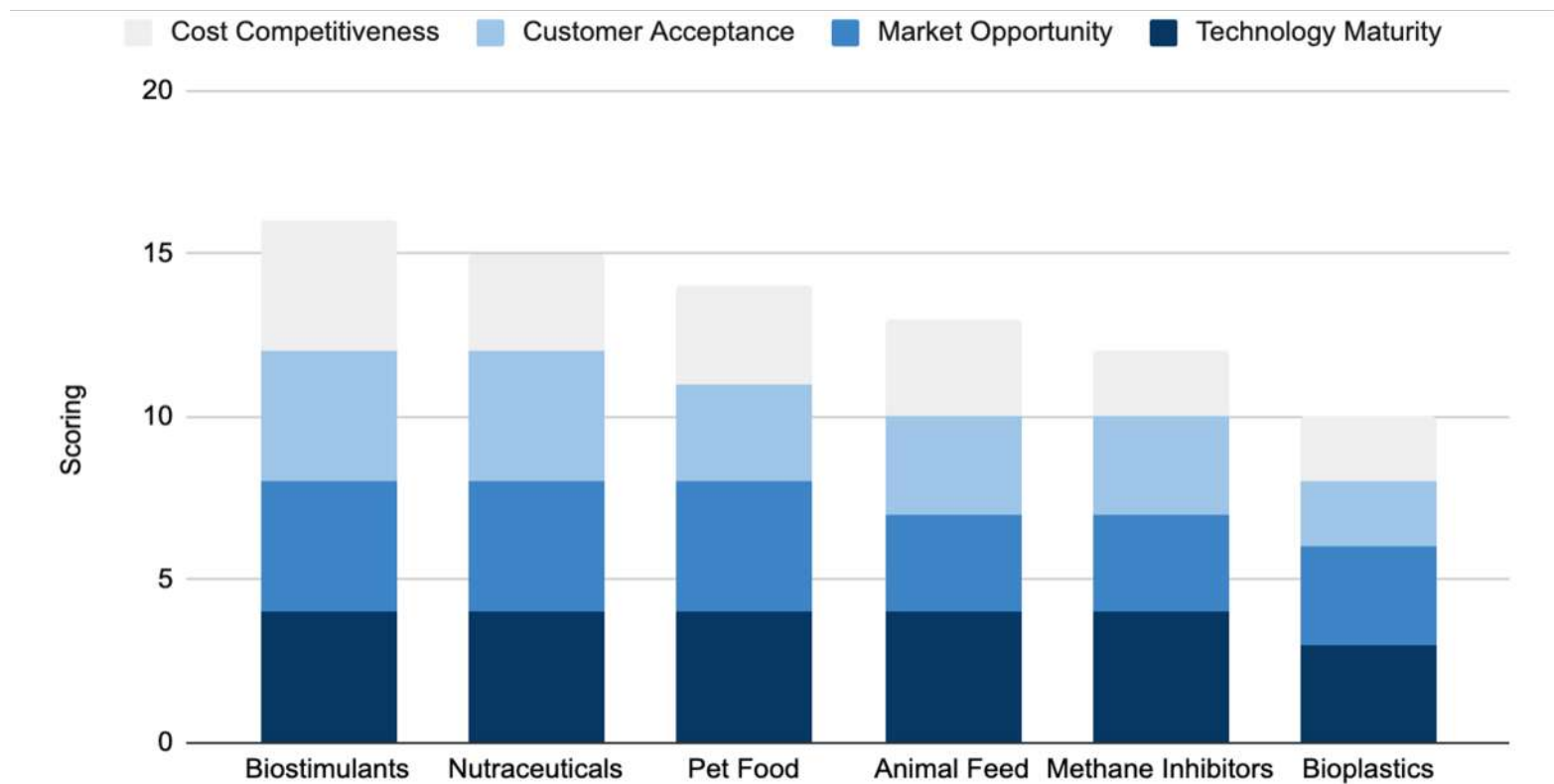
The background of the slide features a photograph of seaweed being cultivated in an aquaculture system. The seaweed is long, thin, and yellowish-brown, hanging from dark vertical supports. The water is clear and blue. The image is partially obscured by a green vertical bar on the right side.

Seaweed aquaculture is a socio-economic powerhouse and can serve as a replacement for higher GHG emissions products.

Cultivating seaweed can provide environmental benefits including water filtration, climate mitigation, and habitat provisioning

Diverse applications and uses, including for agricultural and soil health

Seaweed Biostimulants are a particularly promising near-term market for farmed seaweeds



	Seaweed's role in the product	Case studies
Biostimulants	Bioactive compounds	Acadian Seaplants
Animal feed additives	Bioactive compounds Protein	Olmix
Pet food additives	Bioactive compounds Protein Hydrocolloids	Nestle Purina
Nutraceuticals	Bioactive compounds Hydrocolloids	Kamerycah
Cosmetics	Bioactive compounds Hydrocolloids	Tate & Lyle
Alternative proteins	Protein	Umaro
Pharmaceuticals	Bioactive compounds (excludes established hydrocolloids for drug delivery)	Genentech
Bioenergy	Carbon Hydrocolloids	Sea Tech Energy
Bioplastics	Carbon (PHA-based bioplastics) Hydrocolloids (hydrocolloid-based bioplastics)	Loliware

Biostimulants are valued at \$1.4 billion globally and seaweed extracts are one of the primary sources of biostimulants today (~32% of market), along with amino and fulvic acids

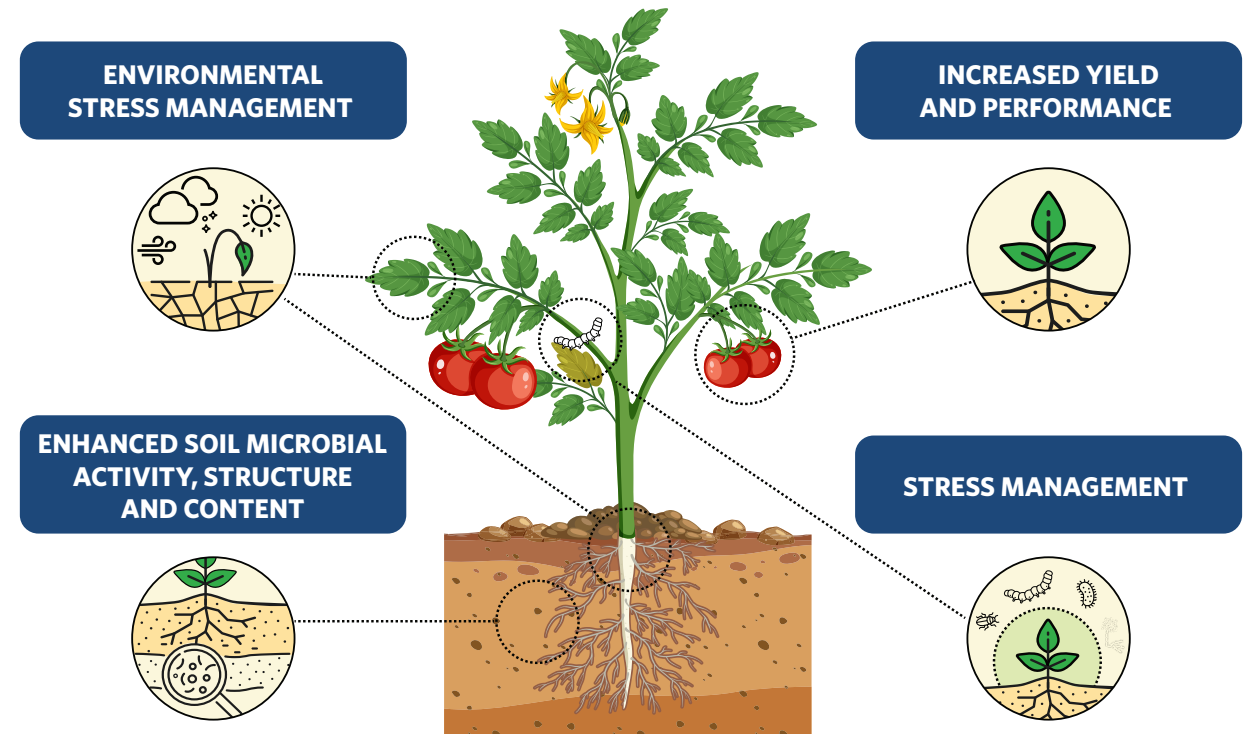
Seaweed Biostimulants

Benefits from sea to soil, both water and land

- Biostimulants are biologically-derived substances that promote plant health, growth and disease tolerance and resistance by improving nutrient uptake and resilience to stressors.
- The use of farmed seaweed as a biostimulant source has the potential to create significant carbon and biodiversity benefits both in water and on land, resulting in reduced carbon emissions and improved soil health.

Increasing pressure on wild harvest and potential to shift to farmed seaweed

- Most current production relies on wild kelp harvests - an increase in wild harvesting could necessitate capping wild harvest over the long term to protect natural habitats, necessitating a transition towards aquaculture to ensure scalable and reliable supply.



TNC, The World Bank, and Hatch Blue co-organized a Seaweed Biostimulants Roundtable



Why Important / Why Now?

- Despite investments in the seaweed aquaculture industry globally, we have collectively failed to create and grow sustained markets for new entrants in the industry to thrive.
- Without secure and robust markets, the seaweed momentum will be fleeting and it will collapse, and with it, the key climate and biodiversity benefits a scaled industry would bring

Seaweed Biostimulants Roundtable

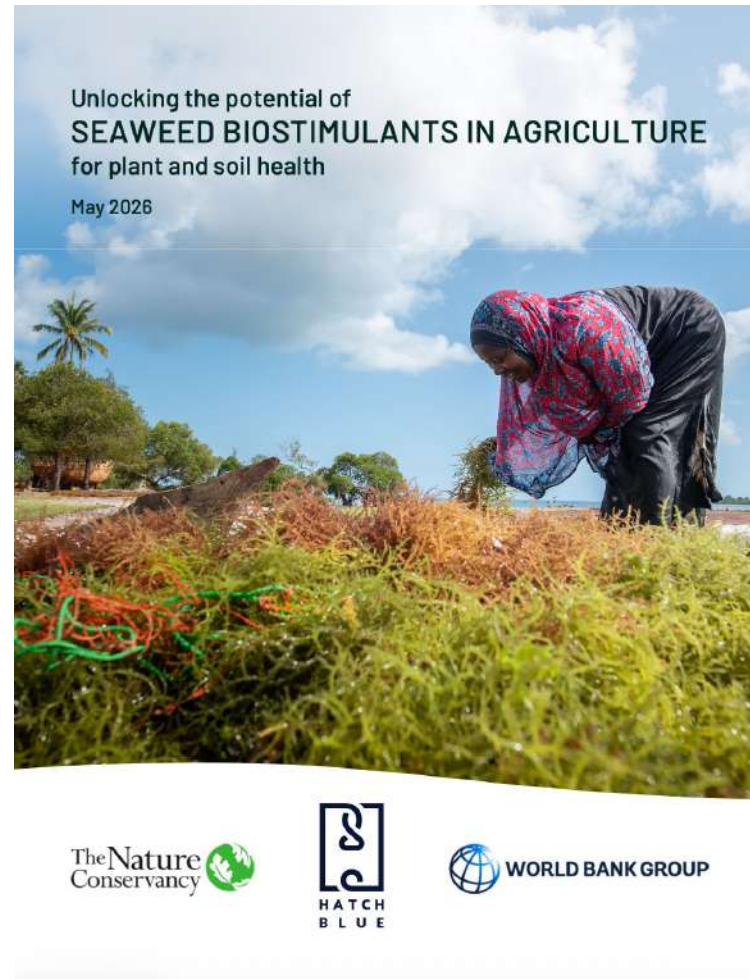
- In October, 2025, we convened ~90 leaders across seaweed farming, biostimulant innovation, agriculture, science, investment, and government to share knowledge, research, and opportunities

Objectives

- To bring together seaweed biostimulant supply chain actors to share knowledge, research, and opportunities for scaling the market in the next 3-5 years.
- To create a white paper and roadmap charting a course toward a farmed seaweed biostimulant market, inclusive of identifying R&D and financing needs and enabling these commitments.

Two reports to be published this month

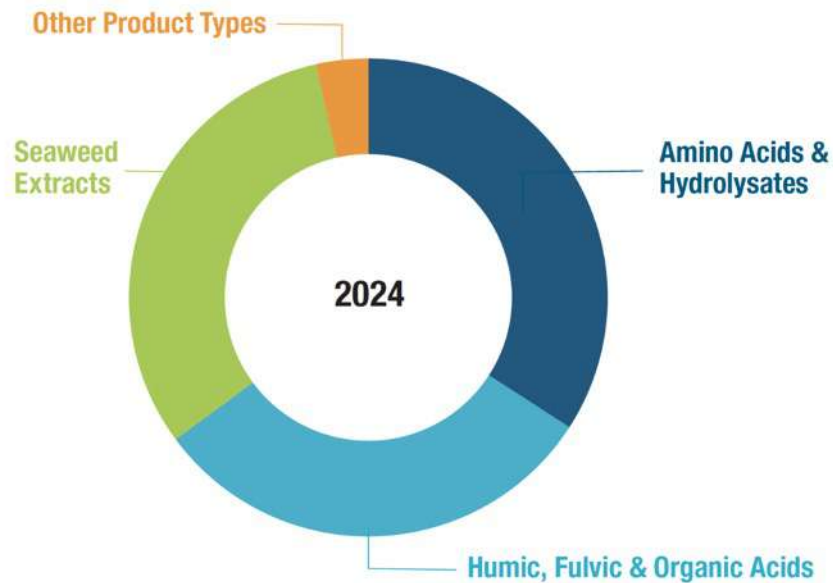
1. **white paper and roadmap** laying out a clear pathway to scale the industry through strategic investments, enabling policies and regulatory frameworks, research and innovation, and cross-sector collaboration
2. **seaweed farmer-focused guide** on the seaweed existing biostimulants market and what it takes to get started, including species selection, production systems, regulatory systems, and pathways to market



will be available at: www.aquaculturescience.org

Seaweed extracts comprised ~32% of the biostimulants market in 2024, similar in size to the market share of the other top two categories of biostimulants

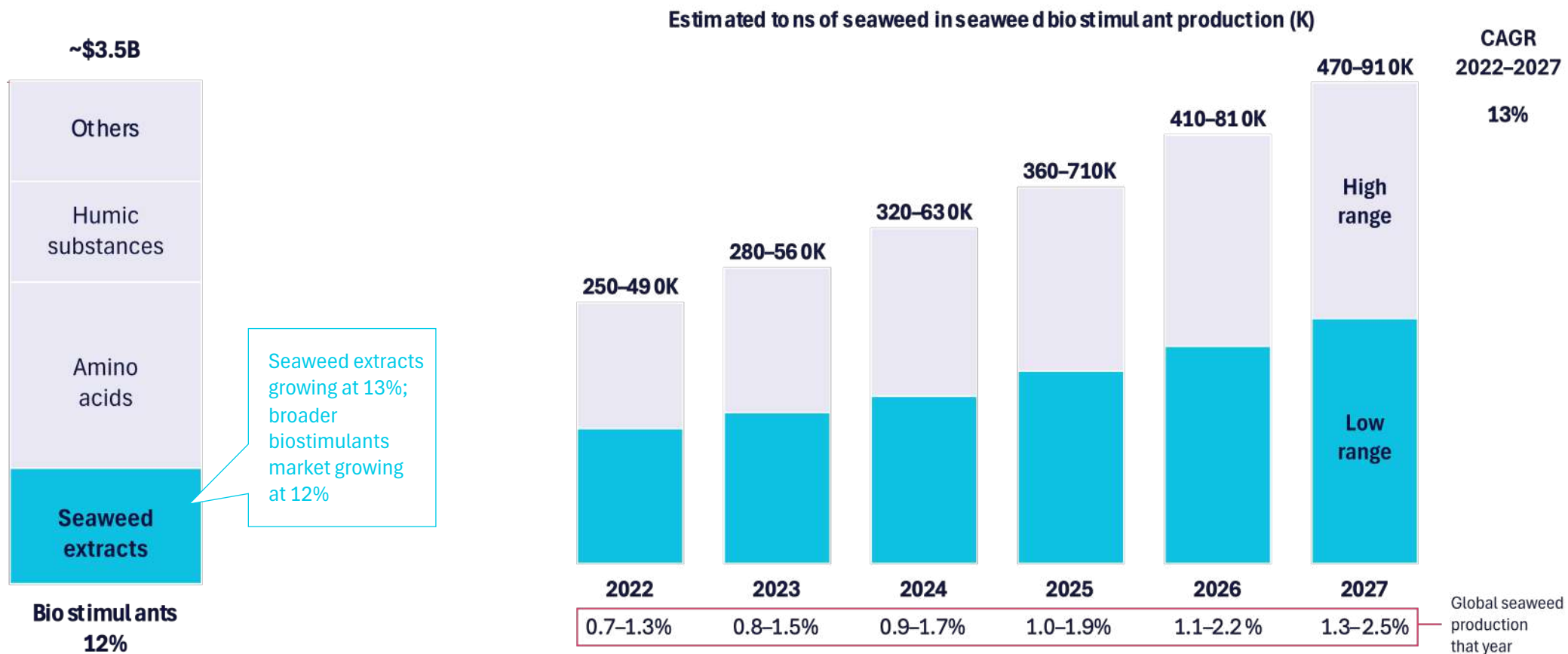
2024 GLOBAL PRODUCT TYPE MARKET VALUES (MN) USD



TOTAL MARKET VALUE (MN) \$4466.5			
Amino Acids & Hydrolysates \$1524.6	Humic, Fulvic & Organic Acids \$1373.2	Seaweed Extracts \$1411.6	Other Product Types \$157.1



Seaweed extracts for biostimulants will require an estimated ~700k tons of seaweed to produce by 2027



Zoom-in: Seaweed biostimulants market sizes

Latin America and Asia-Pacific have seen the fastest growth in the category in recent years.

North America

Total Non-microbial Biostimulants Market Size 2024: **1,070 million \$**

TAM Cultivated Seaweed Biostimulants Value 2024: **357 million \$**

Europe

Total Non-microbial Biostimulants Market Size 2024: **800 million \$**

TAM Cultivated Seaweed Biostimulants Value 2024: **267 million \$**

Asia Pacific

Total Non-microbial Biostimulants Market Size 2024:

1,130 million \$

TAM Cultivated Seaweed Biostimulants Value 2024:

377 million \$

Latin America

Total Non-microbial Biostimulants Market Size 2024:

1,210 million \$

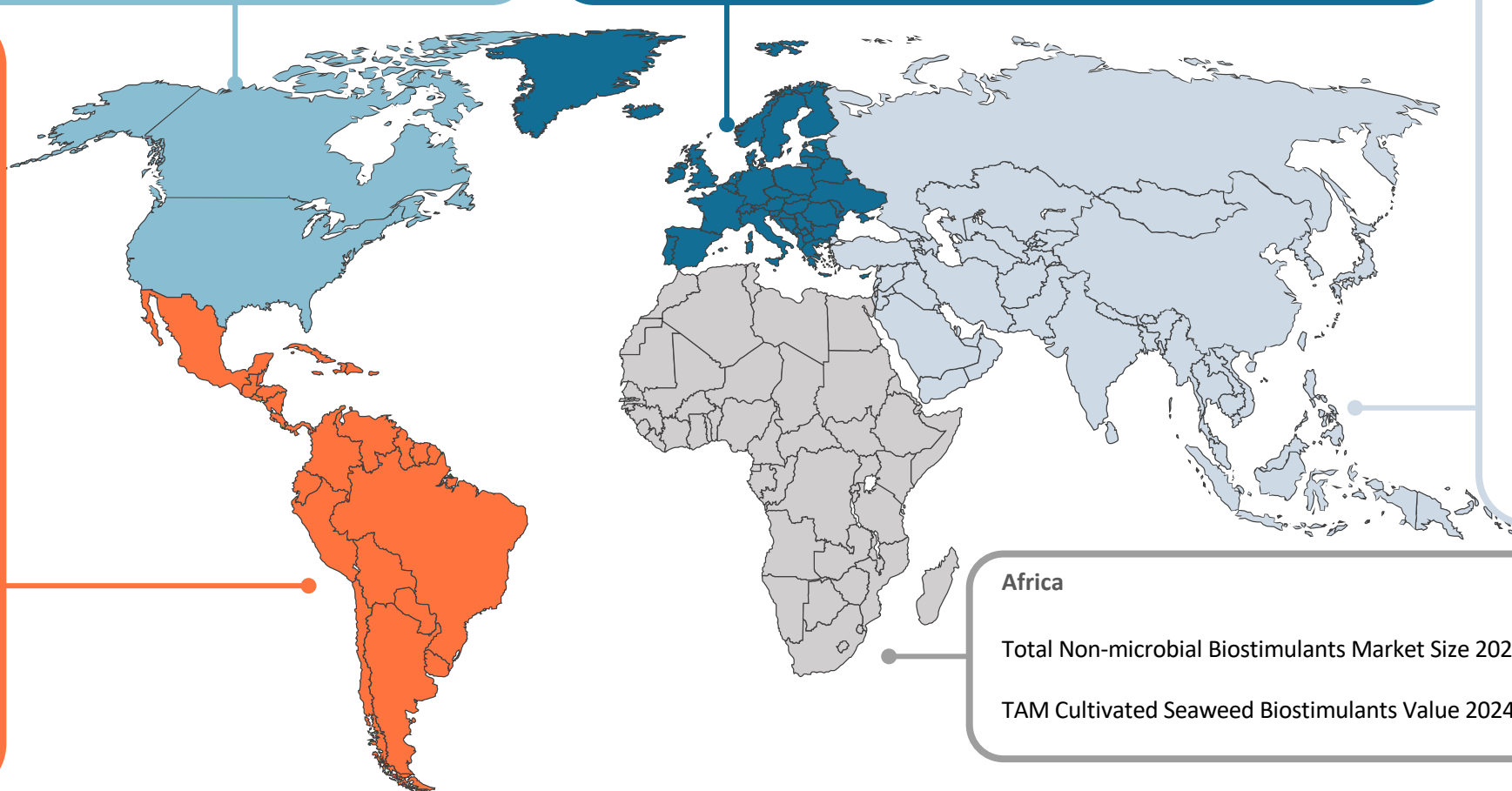
TAM Cultivated Seaweed Biostimulants Value 2024:

403 million \$

Africa

Total Non-microbial Biostimulants Market Size 2024: **290 million \$**

TAM Cultivated Seaweed Biostimulants Value 2024: **97 million \$**



Note: we assume 100% of the wild seaweed's share of total biostimulant market is replaced by cultivated seaweed based biostimulant.

Farmers require standardized products, clear ROI demonstration, and consistent supply to justify premium pricing over synthetic alternatives

Product Standards & Farmer Expectations

- Farmers demand products meeting established agricultural standards for effectiveness and reliability
- There is a need for more standardized testing methods and certification programs

Cost Competitiveness & Value Demonstration

- Seaweed biostimulants are often more expensive than conventional chemical alternatives
- Farmers require substantiated evidence of return on investment to justify premium pricing
- There is a need for clearer communication of unique benefits and how they stand apart from competitors

Supply Continuity & Quality Consistency

- Wild harvesting limits supply and farming, when done well, can be viewed as scalable sustainable alternative
- Challenges include controlling production costs and ensuring seedstock supply
- There can be variability in effectiveness due to source species, growing conditions, and processing methods

Scaling further requires coordinated action between aquaculture and agriculture sectors



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Product Relevance in Agriculture

Key needs for market growth:

- Clear **price points** aligned with farmer expectations
- Defined **product performance expectations**
- Collaborative research to quantify farmer ROI, environmental benefits, and real-world efficacy
- Better understanding of market demands to guide seaweed product innovation

Market Standards

- Farmers expect seaweed biostimulants to meet **established agricultural standards** and deliver measurable benefits
- Regulatory frameworks vary globally → leading to **inconsistencies, confusion, and market access barriers**
- Global need for **comparable standards and clearer product categories**
- EU's **2022 Fertilizing Products Regulation (FPR)**:
 - Establishes unified CE-marking
 - Provides a clear definition of “biostimulants”
 - Harmonizes approval processes and quality requirements
- Strong collaboration needed between seaweed and terrestrial agriculture sectors to advocate for regulatory updates and support market entry

Challenges can be met by pursuing five key recommendations, which focus on immediate needs and urge collaboration among agricultural and aquacultural stakeholders, government authorities, and private investors

01

Streamline regulatory frameworks and permitting processes

02

Invest in R&D to optimize cultivation, efficacy, and processing

03

Support infrastructure: hatcheries and biorefineries

04

Enable collaboration across agriculture and aquaculture sectors

05

Implement financial incentives to drive adoption



Year 1 short-term priorities and actions

Connect the community.

- Facilitate collaboration between aquaculture, agriculture, government, and research partners to set R&D priorities.
- Clarify farmers' needs and expectations.
- Identify and engage stakeholders.
- Put in place communication strategies.
- Identify sharable information and develop and establish knowledge exchange networks/approaches.
- Hold a second roundtable to set priorities for the White Paper Work Plan.

Develop products and the market overall.

- Collate and share data on seaweed biostimulant product performance.
- Validate effectiveness and identify gaps (in species, crops, and traits) for further R&D.
- Identify additional knowledge gaps in product efficacy and the supply chain.
- Initiate market and supply chain analyses.
- Assess government incentives/grants and novel finance approaches and suggest improvements to support industry growth, including blended finance mechanisms.
- Identify and disseminate funding opportunities.
- Develop strategies to reduce reliance on imports and strengthen domestic supply chains.
- Define key traits in current biostimulants and outline R&D to optimize them or discover new species.

Develop capacity and capability.

- Specify R&D needs to support transfer from wild harvest to aquaculture and ensure reliable, biosecure seedstock.
- Assess workforce skill gaps and create a capacity-building plan.

Enhance governance (regulatory and policy frameworks).

- Develop a plan for the delivery of product standards, standardized testing, and traceability protocols.
- Address gaps in certification schemes to enhance credibility and access to the market for premium seaweed products.
- Recommend a simplified permitting approach.
- Review the integration of biostimulants into credit systems.

Advance a sustainability proposition.

- Compile sustainability data to assess biostimulant effectiveness and knowledge gaps.
- Propose improved methods for measuring sustainability benefits and research life cycle assessment (LCA) options.
- Evaluate the benefits of additional environmental sustainability options (e.g., credit systems).

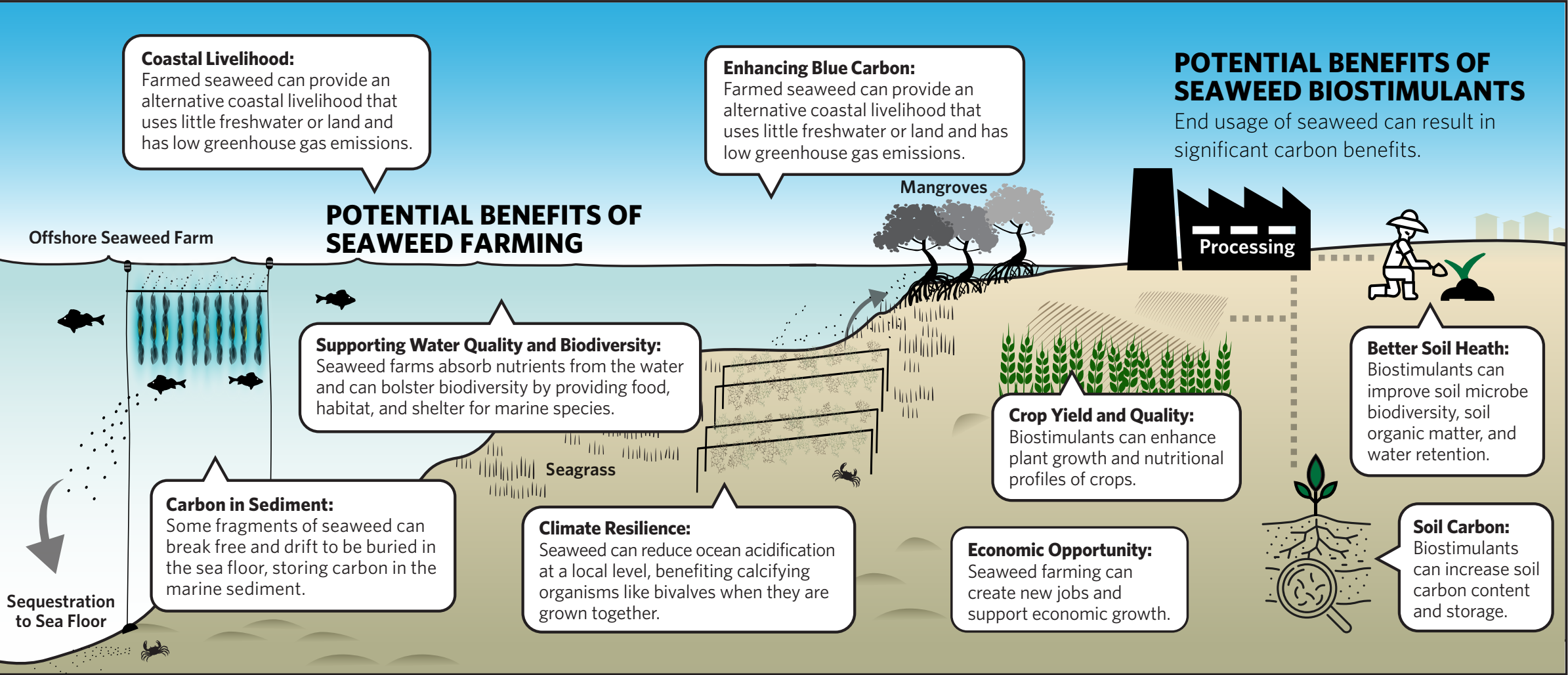
Year 1 / Short-term Priorities and Actions for Seaweed Biostimulant Industry Development

Table 7. R&D priority areas organized by sector/sectoral relevance.

Stakeholder	Sectoral R&D focus area
Government (national & regional)	▪ Include seaweed biostimulants in strategic industry planning. ▪ Develop policies to improve access to seaweed aquaculture. ▪ Offer subsidies, incentives, and R&D grants for seaweed farming that include longer terms and coordinated grant cycles. ▪ Manage wild-harvest impacts and help businesses shift to aquaculture. ▪ Streamline permits, licensing, and export/import regulations. ▪ Link agriculture and aquaculture through targeted research and advocacy. ▪ Fund focused R&D to address technical challenges and build robust hatchery networks and supply chains. ▪ Provide support for large-scale validation trials. ▪ Facilitate platforms for data and knowledge sharing.
Private investors (nongovernmental organizations, funders, & industry associates)	▪ Focus R&D on solving technical and commercial challenges. ▪ Reduce seaweed costs while maintaining sustainability. ▪ Partner with industry, researchers, and government. ▪ Support policies to grow supply chains and markets. ▪ Offer patient, non-dilutive catalytic capital that is potentially linked to offtake or trial data (e.g., supply chain finance). ▪ Educate a wider investor base to help with investor literacy on complex R&D and technical details.
Seaweed farmers	▪ Partner with agriculture, research, and government. ▪ Expand markets with industry and government; assess risks and opportunities. ▪ Target R&D to solve technical and commercial challenges, support national hatchery networks, improve farming, and strengthen supply chains. ▪ Support policies that boost sector growth and market development.
Agricultural farmers	▪ Inform priorities and provide opportunities for farm-scale biostimulant trials, which may include seeking provisions for subsidies or insurance. ▪ Support policies for sector growth, supply chains, and markets. ▪ Partner with industry, researchers, and government.
Research organizations	▪ Study core product qualities and unique benefits. ▪ Confirm pre-commercial product benefits. ▪ Create new processing methods, products, and applications. ▪ Advance research linking agriculture and aquaculture through targeted studies, improved techniques, product development, and the validation of effectiveness and sustainability.
Supply chain partners	▪ Partner with industry, researchers, and government. ▪ Develop products and processes. ▪ Clarify value chains and sustainability. ▪ Enhance market access by advancing relevant standards, certifications, and regulations.



Collaborative action across government, industry, and research can unlock the potential of farmed seaweed biostimulants for marine, soil, and plant health



Thank you



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