



Global Seaweed Coalition

ANNUAL REPORT

JAN 2021 - DEC 2022



FOREWORD

The Global Seaweed Coalition (GSC) is a global partnership established to support the safety and sustainability of the seaweed industry as it scales up, and to unite a fragmented market through a unified vision and goals. The 2020 Seaweed Manifesto, a collaborative effort of the three founding partners – Lloyd's Register Foundation, the Sustainable Ocean Business Action Platform of United Nations Global Compact (UN Global Compact), and the French National Research Centre (French acronym CNRS) – laid the groundwork to establish the Coalition. It was formally launched as the Safe Seaweed Coalition at an online event hosted by the Financial Times on March 17, 2021.

The GSC's strategic action is articulated around four pillars: **funding, advocacy** (encompassing communications, partnerships, and stakeholder engagement), **science and technology** (including knowledge generation), and **policy**. It achieves its results by engaging in high-level international, regional, and sector-specific fora and providing seed funding for projects through competitive Calls for Proposals that advance the state of science and safety in the sector.

In 2023, the Coalition became the Global Seaweed Coalition, with a transition to a new host organization and governance structure (see Appendix 1). The name change reflected the reality of its global reach while maintaining the original emphasis on environmental, consumer, and occupational safety in the sector. A small, agile Leadership Committee comprised of representatives of the founding partner organizations provides strategic oversight and makes key decisions on funding. The Leadership Committee in turn benefits from the input of two advisory bodies, namely a Scientific Council and a Strategic Advisory Council (see Appendix 2).

The Scientific Council is composed of independent academic researchers, each an expert in their field of expertise in the seaweed value chain. Its main objective is to provide a scientific vision for the seaweed sector through advice on the Coalition's activities and more broadly by providing a platform for the generation and dissemination of knowledge about seaweed. The Strategic Advisory Council comprises representatives of GSC partners and reflects all parts of the seaweed value chain. Members are drawn from value chain organizations (including organizations representing small-scale and Indigenous actors), international organizations, academia, governments, and Coalition financiers. This Council furnishes perspectives and guidance on seaweed and its role in the global economy, society, and the environment in complement to the Scientific Council's broad and deep scientific knowledge of the seaweed sector.

This Annual Report presents the results of the first two years of the Coalition's operation, as the Safe Seaweed Coalition.

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Ruth Bounphrey
(Lloyd's Register Foundation)



Sanda Ojiambo
(United Nations Global Compact)



André le Bivic
(CNRS)

MESSAGE FROM THE FOUNDING PARTNERS

Our planet faces an unparalleled crisis, marked by pressing environmental and social concerns that call for immediate action. **The seaweed sector offers promising solutions to help restore oceanic environments, mitigate climate change impacts, reduce overexploitation of resources, and improve livelihoods for millions of smallholders.** However, despite the sector's enormous promise, it lacked a unifying force. That is why we combined forces in 2021 to launch the Safe Seaweed Coalition – to generate momentum within the seaweed sector, and help develop an industry prioritizing safety, backed by scientific expertise, and contributing to achievement of the United Nations' Sustainable Development Goals. We are proud of the results the Coalition has generated so far and look forward to even greater success in its new incarnation as the Global Seaweed Coalition.

In its brief two years of operation, **with initial funding of £3 million from Lloyd's Register Foundation¹**, the Coalition has delivered on much of the ambitious agenda we set out for it.

In 2021-2022, the Coalition generated extraordinary momentum, delivering over €1.1 million in grant funding to 24 projects around the globe, with a new funding round planned for Fall 2023.

The Coalition has also been actively engaged in international conferences and participated in the organization of key events for both public and private sectors. It generated extensive knowledge and shared safety best practices to help advance the understanding of seaweed science and introduced seaweed into key policy arenas to raise awareness about seaweed and its sustainability and regenerative potential.

One of the highlights for us, as the Coalition's founding partners, has undoubtedly been the publication in French and subsequent translation into English and Spanish of *La Révolution des Algues* by Vincent Doumeizel. As a staff member of both Lloyd's Register Foundation and UN Global Compact, we have been proud to support his dream and energy in co-founding the Coalition.

With the rebranding of the Coalition as the Global Seaweed Coalition and its shift to being hosted by the UN Global Compact, together with its strengthened governance structure, we have high hopes for the next phase of its operation. A few actions remain to deliver on the initial promise of the Safe Seaweed Coalition, notably carrying out a third Call for Proposals and completing some key recruitments to reinforce the Secretariat.

Leveraging being part of the UN Global Compact, we look forward to the Coalition's gaining greater access to high-level international fora, as well as improved opportunities for partnerships and fundraising. We are

¹ A complementary project run by Wageningen University & Research (WUR), "Safe Seaweed by Design," received £789,000 in support from Lloyd's Register Foundation.

counting on the new Councils to contribute both scientific depth and strategic breadth, including to help identify ambitious targets for seaweed to be incorporated into the upcoming COP28 and beyond.

We have ambitious expectations for the Coalition's next five years. We are committed to seeing it prioritize safety while making a profound impact on sustainability, particularly in addressing climate change and enhancing livelihoods globally. We are keen to see its membership base continue to grow, fostering a diverse and dynamic Coalition that can drive meaningful change. We will continue to encourage the Coalition to advocate for rigorous research and responsible practices. Knowledge generation and dissemination will also stay a priority for us. Additionally, we want to see policymakers take concrete actions based on the Coalition's recommendations, solidifying its position as a trusted voice in policy circles. Ultimately, we are challenging the Coalition to attract significant funding to realize its ambitious agenda.

We extend our thanks to the dedicated teams behind the 24 projects the Global Seaweed Coalition has financed to date. We would also like to acknowledge the many who sought funding, demonstrating the strong and as yet unmet demand for financing in the sector.

We are deeply appreciative of the CNRS for serving as the initial host and laying a solid scientific base for the Coalition's work.

Members of the Safe Seaweed Coalition's Steering Committee provided pivotal guidance, insight, and strategic direction. Further, the active involvement of the Coalition's members underscores the member-driven nature of this partnership. Their thoughtful contributions, for instance in roundtable discussions, were indispensable in shaping its early strategic directions. And we are grateful to the members of the innovative Seaweed Ambassadors Programme for their efforts to spark global interest in seaweed.

Special acknowledgments are due to the Coalition Secretariat and our partners, whose unwavering

dedication and hard work continue to drive our collective mission forward.

What lies ahead?

We are excited at the prospect of the Coalition's making a meaningful contribution to curbing climate change and advancing to work together to establish a seaweed industry that provides safe products, safe working conditions and environmental protection as it grows. The Coalition is well-positioned to contribute to upcoming major events related to the Ocean, while also playing a pivotal role in addressing bottlenecks and challenges within the seaweed industry.

We are also enthusiastic about the Coalition's growing network of partnerships. The continued valuable partnership with the Aquatic Blue Food Coalition, which emerged from the UN Food Systems Summit, has helped extend the GSC's reach. And we look forward to the fruit of nascent collaborations with the UN Environment Programme (UNEP) and the United Nations Conference on Trade and Development (UNCTAD).

In addition to UN entities, we are delighted to see the Coalition's pursuing long-term partnerships with governments, industry actors, and philanthropic organizations.

For the Coalition to accomplish its ambitious goals, funding levels must increase – by an order of magnitude. We believe it is time for a Global Fund for Seaweed to marshal the needed capital and direct it towards priority needs in the sector, including supporting the continued operation of the Coalition and its Secretariat. To that end, we have tasked the Secretariat team with seeking new funding from private, public, and philanthropic sources.

We are deeply committed to the future of the GSC and look forward to seeing the impact of its continued action, grounded in the latest and best science, so it may even more effectively support the growth and development of a safe and unified seaweed sector.



Ruth Bournemouth



Sanda Ojiambo



André le Bivic

OUR HISTORY

2020

- 4 June: [Seaweed Manifesto](#)
- 22 September: Presentation of the Seaweed Manifesto during a side event at UN General Assembly

A GLOBAL SEAWEED COALITION FOR A SAFER WORLD

WHY SEAWEED?

Seaweed has the potential to help address some of the world's most pressing challenges. It plays a crucial role in healthy food systems—that is, healthy people, healthy planet, and healthy economy. Seaweed can be used as a sustainable, nutritious food source for humans and animals, help enrich soils and complement terrestrial fertilizers by boosting plant nutrition, and be a source of innovative materials ranging from plastics substitutes to sustainable building bricks. By providing natural habitat and food for marine life, seaweed can help restore ocean biodiversity. It can help re-oxygenate and de-acidify surrounding waters, and reduce ocean pollution by removing excess nutrients, often the result of terrestrial runoff. It has multiple applications in medicine, packaging, and textiles. Seaweed cultivation and transformation can be a source of alternative livelihoods for fishers, especially women, building the resilience of coastal communities by providing new sources of employment and revenue. Important research is underway on seaweed's potential to mitigate climate change through reduction of ruminant methane emissions and atmospheric carbon dioxide removal.

Seaweed aquaculture accounts for 51.3% of global mariculture production and has been growing at a rate of 6.2% per year (2000–2018) (World Bank, 2023). In 2019, 34.7 million tons (Mt) of seaweed were produced, with a first-sale market value of US\$14.7 billion (FAO, 2021)



ABOUT US

Our Mission Statement:

Supporting the safe and sustainable scale-up of the seaweed sector, grounded in science.

Our Approach:

As a coalition, we are driven by collaboration between members to establish the resilient foundation the seaweed industry needs to scale up, responsibly and sustainably, and to deliver on the United Nations' Sustainable Development Goals. Working 'bottom up' helps us understand both the safety issues and the challenges faced by value chain actors. This approach unifies our members, keeping us focused on the most urgent challenges and ensuring we advocate for the shared interests of the entire industry.

Our four Action Pillars:

- **FUNDING:** Supporting a safe and scaled-up seaweed industry through targeted funding
- **ADVOCACY:** Spreading the narrative in global forums, delivering on the Coalition's impact
- **SCIENCE & TECHNOLOGY:** Sharing knowledge and safety best practices, feeding into policymaking
- **POLICY:** Driving and influencing policy from local to global levels

A member-driven organization:

The Global Seaweed Coalition has members on every continent except Antarctica. Membership crossed the 1000 mark in 2023, to stand at 1162 in some 90 countries. Members represent the full array of seaweed stakeholders, from smallholder farmers to multinational businesses, specialized research institutes to intergovernmental organizations – all working together to realize the full potential of the seaweed industry and to ensure its safety for consumers, for workers, and for the environment.

Ubuntoo, the GSC membership's platform, provides a collaborative space that helps accelerate cooperation, visibility, and knowledge exchange. It is a useful tool for investors and value chain visibility and building.

OUR PARTNERS



Lloyd's Register Foundation

[Lloyd's Register Foundation](#) is an independent global charity with a unique structure and an important mission: engineering a safer world.



French National Research Centre (CNRS)

The [French National Centre for Scientific Research](#) is among the world's leading research institutions. With the Sorbonne University (Paris), the CNRS jointly runs the Station Biologique de Roscoff (SBR), a centre for research and higher education specialized in marine biology and ecology.



United Nations Global Compact (UN Global Compact)

As a special initiative of the UN Secretary-General, the [United Nations Global Compact](#) is a call to companies everywhere to align their operations and strategies with Ten Principles in the areas of human rights, labour, environment, and anti-corruption.



We would like to acknowledge and thank our supporting partners:

- Station Biologique de Roscoff
- ALGA+
- National University of Ireland (NUI Galway)
- Foundation for Industrial and Technical Research, Norway (SINTEF)
- Scottish Association for Marine Science (SAMS)
- Global Environment Facility (GEF)
- European Marine Biological Resource Centre (EMBRC)
- Ningbo University
- Seaweed Industry Association of the Philippines (SIAP)
- World Wildlife Fund (WWF)
- Aquaculture Stewardship Council
- Universidad de los Lagos



In close collaboration with:

- Aquatic Blue Food Coalition (ABFC)



Collaborations:

- United Nations Conference on Trade and Development (UNCTAD)
- United Nations Environment Programme (UNEP)

- **17 March:** Official launch of the [Safe Seaweed Coalition](#), Financial Times virtual event
- **22-28 March:** Spoke at the [Monaco Ocean Week](#), Monaco
- **13 April:** Organized Coalition Roundtable, virtual
- **28 April:** Organized the Food Systems Summit Independent Dialogue: Powering the Seaweed Revolution for Transformational Change in our Food System, virtual
- **7 July:** Organized the Food Systems Summit Dialogue: UNFSS Science Days Side Event on the challenge of domestication in sustainable seaweed aquaculture, virtual

FUNDING

SUPPORTING A SAFE AND SCALED-UP SEAWEED INDUSTRY THROUGH TARGETED FUNDING

The Global Seaweed Coalition delivered €1.1m to 24 projects across 26 countries on every continent except Antarctica, through two heavily subscribed Calls for Proposals (see Appendix 3). A third Call is planned for late 2023. The proposals awarded funding addressed the Coalition's three safety focus areas: consumer, environmental, and operational. These projects are expected to have a long-term impact across the whole seaweed value chain,

especially in developing countries and smallholder communities. They cover a wide range of topics, namely: food and consumer safety, bio-based packaging safety, environmental safety, biosecurity, certification, traceability, occupational health, technology, and innovation safety.

Number of projects funded	24
Number of countries	26
Total funding delivered to date	€1.1m
Average funding per project	€45,833

The first Call resulted in €700k in funding. The Coalition received 71 proposals and financed 16 with seed funding capped at €50k each. In the second Call, for €400k, the GSC received 58 proposals and financed 8. The gap between submitted and supported funding requests reflects significant unmet demand for Coalition financing. Therefore, the GSC now actively seeks funds from private, public, and philanthropic donors.

Number of projects funded covering SDGs:	
SDG 1: No Poverty	10
SDG 2: Zero Hunger	16
SDG 3: Good Health and Well-being	9
SDG 4: Quality Education	3
SDG 5: Gender Equality	8
SDG 6: Clean Water and Sanitation	1
SDG 7: Affordable and Clean Energy	1
SDG 8: Decent Work and Economic Growth	11
SDG 9: Industry, Innovation, and Infrastructure	8
SDG 10: Reduced Inequalities	5
SDG 11: Sustainable Cities and Communities	3
SDG 12: Responsible Consumption and Production	15
SDG 13: Climate Action	14
SDG 14: Life Below Water	21
SDG 15: Life on Land	2
SDG 16: Peace, Justice, and Strong Institutions	0
SDG 17: Partnerships for the Goals	4

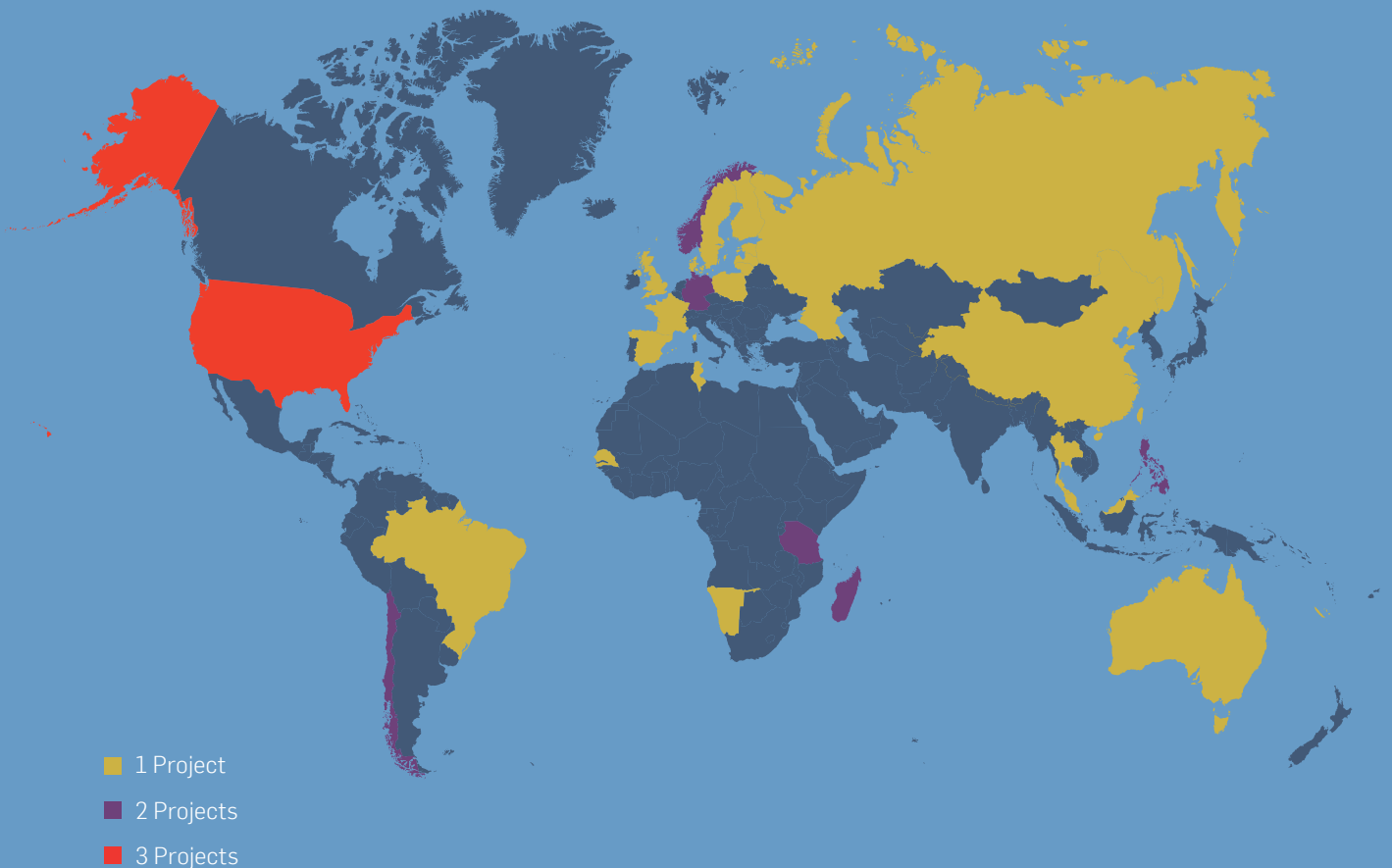
All proposals were assessed through a rigorous selection process involving more than 30 external experts and advisors from over 25 institutions and 10 countries. A suitable geographical balance in its selection of projects across all continents was also taken into consideration.



2021

- **8 July:** Sanda Ojiambo, CEO of the UN Global Compact delivered a talk about Seaweed Coalition objectives at [UN Food System Summit](#) on behalf of the Coalition
- **30 September:** Launch of UNGC [Vision Statement on Seaweed as Nature Based Solution](#), feeding into COP26: Science is needed to move towards a seaweed carbon credit standard
- **15 October:** Creation of the FAO Expert Working Group and workshop aiming to update the [Codex Alimentarius](#) for seaweed
- **31 October - 12 November:** Talk during Ocean Day and seaweed session at [COP26](#), Glasgow, United Kingdom
- **December 2021:** Aquatic Blue Food Coalition partnership

24 projects operating across 26 countries



- **12 January:** Release of "La Révolution des Algues" by Vincent Doumeizel (English version April, 2023)
- **10 February:** Spoke at the [One Ocean Summit, Brest, France](#)
- **21-26 March:** Spoke at [Monaco Ocean Week](#), Monaco
- **25-29 April:** Participated in WWF Social License to Operate Workshop and attended the [Northeast Aquaculture Conference](#), Portland, Maine
- **29 June:** Organized first SSC Annual Meeting, followed by [Seaweed Day](#), in Lisbon, Portugal

ADVOCACY

SPREADING THE NARRATIVE IN GLOBAL FORUMS, DELIVERING ON THE COALITION'S IMPACT

Following the release of the Seaweed Manifesto in 2020 by Lloyd's Register Foundation and United Nations Global Compact's Sustainable Ocean Business Action Platform, the Safe Seaweed Coalition officially launched on March 17th, 2021. This digital event, hosted by the Financial Times, **discussed the convergence of investment and interest around seaweed and what needs to be done to establish critical infrastructure, regulations, and technologies to power the safe restoration of oceanic environments.**

Since then, the GSC has been present in international conferences reflecting seaweed's multifaceted contributions to sustainability, including those covering climate, food systems, the Ocean, biodiversity, and plastics. The GSC has also organized key events catering to both the public and private sectors, in addition to many contributions as speakers, moderators, and organizing partners. Highlights include:

- **two Independent Dialogues during the Food Systems Summit, one to introduce seaweed to food systems stakeholders and the other to advance scientific understanding about seaweed within the food system;**
- **several events at the UN Ocean Conference in Lisbon, including an official side event on seaweed and SDG14 and a complementary Seaweed Day focused on seaweed and the other SDGs, notably food security, livelihoods, and environmental sustainability and restoration;**
- **an event at the Biodiversity Conference jointly organized with the Aquatic Blue Food Coalition, as well as joint panels**
- **an event at the opening of the 50th meeting of the UN Committee on World Food Security**
- **a series of impactful webinars on seaweed economics organized jointly with the World Bank**

Coalition members also actively engaged in several member Roundtables about the main issues in the seaweed sector. Through these Roundtables, we identified challenges, defined clear objectives, and laid the groundwork for our first Calls for Proposals.

The Seaweed Ambassadors Programme was created to connect people who are passionate about seaweed and looking for opportunities to communicate about it with diverse audiences. This evolving initiative brings together individuals from across the globe with a variety of backgrounds.

2022

- **30 June:** Organized and spoke at official [UN Ocean Conference side event](#) on seaweed's role in achieving SDG 14, Lisbon, Portugal
- **30 June:** Attended official launch of [Aquatic Blue Food Coalition](#), Lisbon, Portugal
- **14 September:** Spoke at World Bank webinar on Seaweed Economics, virtual
- **10 October:** Organized and spoke at an event at the [Committee on World Food Security 50](#) (CFS50), Rome, Italy
- **11 October:** Contribution to the [report of the expert meeting on food safety for seaweed – Current status and future perspectives](#), released on 28–29 October 2021 in Rome

SCIENCE & TECHNOLOGY

SHARING KNOWLEDGE AND SAFETY BEST PRACTICES, FEEDING INTO POLICYMAKING

The GSC was founded with a strong basis in science. It has benefited from the involvement of individuals and research institutes around the world, in countries such as **China, Korea, Japan, the UK, Norway, France, Tanzania, Chile, Australia, and the United States**. Scientists defined the criteria for the Calls for Proposals and vetted the proposed projects.

Whether through the projects we have financed or through members' ongoing work, GSC stakeholders helped advance understanding of seaweed science, including through their participation in international policy conversations. They are often at the cutting edge of science and technology, including through commercially driven innovation, such as on plastics alternatives. Additionally, research on genetic resource management is emphasized, along with a strong commitment to integrate Indigenous knowledge and collaborate extensively with social scientists for a holistic and sustainable approach.

Our member space, facilitated by Ubuntu, features an expansive knowledge section comprising over 300 selected papers curated by our scientists to enhance the accessibility of valuable insights on seaweed.

We introduced a scientific perspective on seaweed into global discussions, exemplified by our active participation in events like our UN Food Systems Summit Science Days Independent Dialogue, which covered the topic of domestication for sustainable seaweed aquaculture. Our commitment to incorporating scientific insights has not only enriched these conversations, it has also contributed to a more informed and comprehensive understanding of the importance of seaweed in addressing global challenges.



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- **22 November:** Presentation at EU Eurostat Fishery & Aquaculture members meeting in Luxembourg
- **30 November:** Spoke at the World Bank Webinar on perspectives from the private sector to catalyze the #SeaweedRevolution, Washington, DC
- **6 and 16 November:** Spoke virtually at [COP27](#), Sharm el-Sheikh, Egypt

2022

POLICY

DRIVING AND INFLUENCING POLICY FROM LOCAL TO GLOBAL LEVELS

The Global Seaweed Coalition has increasingly been engaging in national and international policy conversations. The Coalition has successfully incorporated seaweed into prominent global dialogues such as climate, food systems, the Ocean, and biodiversity.

A key achievement, together with FAO, was the incorporation of seaweed into the Codex Alimentarius.

The GSC has also been advocating for key policy recommendations, including to:

- **Incorporate seaweed in national development planning, including blue economy strategies, and marine spatial planning**
- **Strengthen international policy for seaweed**
- **Improve standardized information on seaweed species, production, and nutritional qualities at the multilateral level**
- **Generate consistent and better-quality data on global seaweed production, and explicitly measure seaweed production and trade within national accounting systems, to accurately gauge the impact of seaweed**
- **Assign specific public sector institutions to oversee and provide support to the sector**
- **Invest in research and development initiatives focusing on seaweed, in developing and developed countries alike, and at the global level**
- **Develop wild stocks protection policies in regions with high levels of development**
- **Conduct further research to inform policies on blue carbon and carbon credits for seaweed**
- **In line with the Sustainable Development Goals (SDGs), integrate seaweed and aquaculture into SDG14 tracking and other relevant SDG indicators, like the SDG2 indicator Food Insecurity Experience Scale**

- **7 December:** Contributed to the organization of and moderated Aquatic Blue Foods Coalition side event on small-scale fisheries and aquaculture, [Convention on Biological Diversity COP15](#), Montreal, Quebec, Canada
- **13 December:** Agreement to co-organize with European Commission and French government the [1st EU Algae Awareness Summit](#) in Paris, October 2023

OUR MEMBERS' VISION FOR THE FUTURE

With the availability of adequate funds, we envision creating a restorative seaweed industry, backed by science, fully integrated into sustainability policy networks, informing local policies, and delivering impact on many of the SDGs.

As part of our ongoing drive to listen to our members, in February 2023, we conducted roundtable discussions. About 10% of our members joined and collectively articulated their vision for the future of the Coalition around our four core action pillars:

FUNDING

Directing financial resources towards projects in Latin America, Africa, and the Indian Ocean, thereby stimulating growth and development in these regions, was viewed as a priority. Additionally, **our members believe the Coalition needs to guide investors in championing the cause of small-scale farmers, emphasizing fairness throughout the investment process.** Another crucial aspect was felt to be the expansion of knowledge about seaweed, making it easily accessible to smallholders through the establishment of a microcredit fund. Furthermore, roundtable participants were interested in developing a seaweed-specific incubator/accelerator, bridging industry gaps, and fostering peer support networks among stakeholders from diverse value chains.

ADVOCACY

Responding members want the Coalition to emphasize increasing knowledge sharing and communication among them and stakeholders to promote sustainable seaweed sourcing. Furthermore, they would like to see the Coalition support smallholders by raising awareness about existing mechanisms that can provide them with access to funding and valuable knowledge resources. To achieve these objectives, **our members' vision includes**

development of an industry-wide model, which would mean organizing small-scale meetings among farmers and disseminating scientific information through our GSC communication channels.

Additionally, they would like to see the Coalition enhance its presence and influence by participating in ocean-focused conferences, utilizing these platforms to facilitate information sharing, build stronger relationships among stakeholders, and ultimately, increase its visibility in the seaweed industry and beyond.

SCIENCE & TECHNOLOGY

Participants identified logistics, processing, conservation, scaling up production, and infrastructure improvements among the most pressing challenges facing the industry. To address these challenges, our members proposed that **we disseminate more science on carbon credit development, while being continent- and species-specific.** Additionally, conducting research on genetic resource management, integrating Indigenous knowledge, and working more with social scientists should all be emphasized.

POLICY

There is a desire for the Coalition to advocate for more harmonized global policies to support local and national regulations while simplifying permits and licensing. Further, members feel the Coalition should help to improve standardized information about seaweed species, production, and nutritional qualities at the FAO level. More research on blue carbon and carbon credits for seaweed to inform policies is desired. Respondents felt the Coalition should encourage development of wild stocks protection policies, particularly in highly developed regions, and integration of seaweed into national blue economy strategies and marine spatial planning. Lastly, **respondents underscored the importance of ensuring that data on global seaweed production is consistent and high-quality, and meaningfully disaggregated from other aquatic (and other) products.**

ACKNOWLEDGMENTS

SECRETARIAT TEAM:

- Dr. Azzedine Badis, Communications Manager
- Andrea Blanc, Communications Intern
- Vincent Doumeizel, co-Founder
- Nichola Dyer, Senior Advisor, Secretariat Manager
- Sofya Mishchenko, Project Manager, UN Global Compact Ocean Stewardship Coalition
- Dr. Philippe Potin, Scientific Director
- Adrien Vincent, Fundraising Manager

PAST MEMBERS OF SECRETARIAT TEAM:

- Allison Byrd, Communications Intern
- Dr. Kevin Cascella, Coalition Manager

PAST CONTRIBUTORS TO SECRETARIAT DELIVERABLES:

- CHARM-EU team: Scarlet Sherriff, Sealia Thévenau, Alèxia Torner Crespo, Thebe Van Rensbergen
- Seaweed Squad: Abegail Anderson, Rachael Franchini, Yumjirdulam Olontumen, Victoria Seekman, Raymond Sison



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APPENDICES

APPENDIX 1: ORIGINAL ADVISORY BOARD & STEERING COMMITTEE

Advisory Board

Dr. Alejandro Buschmann	Tiffany Waters	Prof. John J Bolton	Daniel Hooft
Sarah Hosking	Simon Davis	Dr. Haimin Chen	Dr. Alan T. Critchley
Adrien Vincent	Shally Shanker	Frank Neumann	
Andrea Weber	Maris Stulgis	Graham Clark	
Dr. Sander van den Burg	Dr. Pi Nyvall Collén	Patricia Bianchi	

Steering Committee

Dr. Philippe Potin	Prof. Elizabeth J Cottier-Cook	Prof. Gwang Hoon Kim	Dr. Yoichi Sato
Dr. Flower E. Msuya	Dr. Tim Slingsby	Lisa Boulton	Dr. Jorunn Skjermo
Vincent Doumeizel	Dr. Junning Cai	Steffen Hansen	
Paul Dobbins	Anoushka Concepcion	Jo Kelly	

APPENDIX 2: LEADERSHIP COMMITTEE, SCIENTIFIC COUNCIL & STRATEGIC ADVISORY COUNCIL

Leadership Committee

Tim Slingsby	Erik Giercksky	André Le Bivic
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Scientific Council

Dr. Philippe Potin	Dr. Thierry Chopin	Prof. Catriona Hurd	Dr. Loretta Roberson
Prof. John J Bolton	Prof. Elizabeth J Cottier-Cook	Prof. Gwang Hoon Kim	Dr. Yoichi Sato
Dr. Alejandro Buschmann	Dr. Alan T. Critchley	Phaik-Eem Lim	Dr. Jorunn Skjermo
Junning Cai		Dr. Flower E. Msuya	
		Dr. Zizhong Qi	

Strategic Advisory Council

Anoushka Concepcion	Leticia Carvalho	Asma Lateef	Stefan Schmitz
Dr. Helena Abreu	Dr. Shenggen Fan	Dr. Audun Lem	Maris Stulgis
Raul Socrates Banzuela	Dr. Harrison Charo Karisa	Árni M. Mathiesen	
Lisa Boulton		Bailey Moritz	

PROJECTS FUNDED IN 2021 & 2022

APPENDIX 3: PROJECTS FUNDED

Year	Project Name & Country	Country of Operation	Description of project	Why this project is needed	Outcomes & KPIs	SDGs covered	Safety aspects covered	Amount allocated (£ unless otherwise specified)	Amount leveraged ¹
2021	Sea PoWer (Tanzania)	Tanzania	A seaweed farming innovation for women's empowerment in Tanzania, to improve the safe farming of seaweed, add value, and provide livelihoods for women amidst the challenges presented by climate change.	On land, women are missing out on income generation opportunities and need to consolidate their organizational and value-addition skills to process seaweed in an environment that is both safe for them and the consumers of their products. At sea, women's safety is paramount and they need to learn how to swim and handle a boat in order to farm seaweed safely further offshore.	Approximately 40 women have improved their seaweed processing skills and knowledge , in particular regarding safe handling of products, enabling them to supply a local market with seaweed soaps and lotions. All members of the 3 Sea PoWer-supported groups (approx 40) have learned how to swim and increased their confidence in farming seaweed in deeper water (where it is less sensitive to climate change-induced temperatures and salinity).	1, 2, 5, 8, 12, 13, 14	Operational & livelihood	31,660	\$24,192
2021	MARK Seapack (Norway)	Norway	BZEOS, a Norwegian organization is aspiring to bring food-safe seaweed packaging toward commercialization by addressing legal and regulatory obstacles.	Seaweed-based materials for packaging are novel and clear indications are needed on the regulatory framework to have a clear commercialization path and strategy.	Number of reports acquired on the legal framework (single use plastics directive or SUPD) and food safety compliance for seaweed packaging. Number of migration studies on flexible film samples . Findings were shared publicly, including with competitors, in a webinar attended by over 50 people.	12, 13, 14	Consumer (food security) & environmental	49,362	20,780 (in-kind)
2021	SeaStrains Workshop (Germany)	Germany	The SeaStrains Workshop, implemented by The Alfred Wegener Institute , is a Europe-wide strategy to conserve genetic seaweed resources under the threat of global change through a centralized biobank.	One of the main limitations currently preventing the rapid scale-up of seaweed production in Europe is the availability and maintenance of established seaweed strains and cultivars in biobanks.	Establishment of the SeaStrains Network Execution of the SeaStrains workshop . Database of seaweed strains currently in European public and private collections (in progress). Opinion paper on developing a strategy for safeguarding seaweed genetic resources in Europe (in progress). Publication on analysis of seaweed strains currently in European collections (geographic representation, biodiversity, commercial interest) (in progress).	2, 3, 11, 12, 14	Consumer & environmental	38,193	15,000

¹ Funds received in addition to those from the Coalition

PROJECTS FUNDED IN 2021 & 2022

APPENDIX 3: PROJECTS FUNDED

Year	Project Name & Country	Country of Operation	Description of project	Why this project is needed	Outcomes & KPIs	SDGs covered	Safety aspects covered	Amount allocated (£ unless otherwise specified)	Amount leveraged ¹
2021	Secure Future (Philippines)	Philippines	Hosted by The Marine Environment and Resources Foundation at the University of the Philippines , this project is seeking to select and curate safe and healthy euclidean seedlings for the continued health of the local seaweed industry.	There is an urgent need to generate new seedstocks / cultivars from wild euclidean found around the Philippine archipelago with superior quality, to prevent further declines in genetic diversity and sustain livelihoods of thousands of small-scale farmers and the seaweed industry.	Established methodology for producing seedstock from spores of locally available <i>Kappaphycus alvarezii</i> . Methods on spore induction tested with help of Sea6 Pvt. Ltd. Test planting of high-performing novel strains with help of Coast4C networks and partner local government units. Analysis of carrageenan quality and quantity of these high-performing strains through BFAR-NSTDC.	1, 2, 14	Environmental	\$50,000	136,904
2021	GATEWAY (Malaysia)	Malaysia	The University of Malaya in Malaysia is creating a global taxonomic framework for the carrageenan industry to benefit from biobanking, breeding, and quality control.	The current taxonomic framework for euclidean is inadequate and doesn't correctly identify individuals, which negatively affects the quality of crops and hinders biobanking and breeding efforts, as well as the monitoring of wild stocks.	Multigene phylogeny on 95 samples using 9 molecular markers and genome skimming of 57 samples of key euclidean samples. Multigene phylogeny manuscript submitted and being reviewed Genome skimming project samples under de novo assembly . Workshop including expert from International Commission on the Nomenclature of Cultivated Plants (ICNCP) convened in May 2023. Consensus reached on updated, scientifically robust taxonomic framework of euclidean seaweeds . Standardized naming of cultivated seaweeds proposed based on the ICNCP; to unify the names of cultivars, strains, varieties and other seaweed types in euclidean, and seaweeds more generally. Manuscript of seaweed cultivar naming based on ICNCP in preparation.	1, 2, 5, 8, 13, 14, 17	Environmental	45,826	28,339

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2021	Baltic Sea Safe (Germany)	Baltic Sea Region (10 countries, incl. Germany, Finland and Latvia)	The SUBMARINER Network for Blue Growth is creating a framework for Baltic seaweed bio safety by creating environmental guidance, recommendations, and position papers addressing monitoring and license conditions for cultivating seaweed in the Baltic Sea.	The European Union recently defined the strategic direction for development of its seas and oceans as sustainable blue economy - and blue bioeconomy. However, further steps are necessary to lift the cultivation of seaweed from an experimental to an industrial level in the Baltic Sea.	At least 49 stakeholders from the Baltic Sea and beyond contributed in 2 workshops to develop recommendations on environmental monitoring and license conditions for cultivation of seaweed in the Baltic Sea regarding environmental safety. Resulting outputs and results disseminated to more than 500 Baltic and EU stakeholders and presented at an event in Hamburg.	9, 14	Environmental	42,000	12,000
2021	Biodiversity impact of Kelp cultivation (Netherlands)	Namibia	The Kelp Forest Foundation , together with Kelp Blue (KB) and NatureMetrics (NM), are examining the impact of kelp cultivation on biodiversity by using environmental DNA samples from in and around the cultivated kelp forests to establish the biodiversity baseline and monitor the changes in biodiversity over time.	Kelp forests across the globe provide many ecosystem services and act as important marine habitats hosting rich biodiversity. However, it is still not clear to what extent offshore cultivated kelp forests, grown off man-made structures, will impact the existing ecosystem and biodiversity.	Provide evidence to establish proof-of-concept using field experiments in open ocean conditions to test biodiversity impact. Create collection protocols for eDNA data to be replicated. Guide future measurement strategies and development of research methodologies . Improve public awareness and support through public dissemination of findings.	2, 4, 5, 8, 9, 10, 12, 13, 14, 15	Environmental	50,000	50,000

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2021	Notpla Ooho Investigation (England)	England	Notpla Limited is creating a pilot program for seaweed-based packaging while providing consumers more transparency about where and how seaweed used in the biomaterial is produced.	Using seaweed to create bio-materials is an emerging application for seaweed use that is rapidly developing but requires further research.	Established commercial traction and sold units to a new commercial partner . Significantly upscaled in-house production capacity . Conducted R&D to advance the readiness level of Pipettes. Developed 2 new product sizes. Built a pipeline of prospective customers for commercialisation.	12, 13, 14	Consumer & environment	40,000	£40,000 (Notpla contribution)
2021	Technical Training for Seaweed Cultivation and Safe Production (China)	China	Ningbo University is providing technical training for seaweed cultivation and safe production through safety manuals, online courses, and workshops for international training purposes.	Enhancing the education of practitioners in the seaweed industry is fundamental for the development of the industry, in particular the formulation of a systematic academic reference and simple guidance plans for both professionals and non-professionals.	Seaweed cultivation booklet prepared. Production video shot Training workshop held (300 people). Online and offline science lectures delivered (18 sessions, 200 K people).	4	Operational	32,000	¥15,000
2021	Safe Seaweed Thailand (Thailand)	Thailand	Yumus Foundation in Thailand is developing a social business model for the safe and sustainable growth of the local seaweed industry.	The seaweed industry in Thailand is significantly underdeveloped, climate change is shortening the cultivation season, and pollution is risking the safety of seaweed based food products. At the same time, low income coastal communities in the South of Thailand are vulnerable to extreme weather events and debt.	1 seaweed social business kit for controlled system cultivation developed and piloted in 4 locations. Multi-module training program delivered for 108 community women entrepreneurs and local government officials. 6 episode video manual docuseries for seaweed cultivation and entrepreneurship. 1 research paper published in an international, open access, and peer-reviewed journal. 1 model for a seaweed social business hub developed and resources mobilized for establishment.	1, 2, 3, 4, 5, 8, 9, 10, 13, 14	Environmental, operational, consumer, livelihood	49,850	45,522 (Canada Fund for Local Initiatives) 86,572 (in-kind contributions from project consortium)

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2021	Superior Cultivars for Communities (Madagascar)	Madagascar	Ocean Farmers is actively ensuring the sustainability and safety of the seaweed cultivation industry in Madagascar by initiating a native strain development program aimed at identifying superior cultivars suitable for commercial production. The work also contributes to the national biosecurity policy.	The loss of genetic diversity in cultured Kappaphycus strains has resulted in considerable losses for the aquaculture sector and communities, both in Madagascar and globally.	Start-up and operation of the first macro-algal hatchery in Madagascar. Research partner to exchange expertise and provide training on identification, cataloging and cultivation techniques, focusing on native Eucheumatoids. First successful induction of in vitro sporulation from fertile wild plants , resulting in production of F1 juveniles.	1, 2, 8, 13, 14	Environmental & operational	£41,944	£8,976
2021	REBECA Seaweed (Spain)	Spain	Banco Español de Algas (BEA – Spanish Bank of Algae) is creating a reference collection of seaweed from Macaronesia to conserve the biological diversity of local seaweed and ocean life.	Scientific reports on conserving the biological biodiversity of the oceans and seaweed are needed, in particular in biodiversity hotspots such as Macaronesia.	Two courses and three training sessions to improve knowledge of technical and scientific personnel , working with biological samples. Develop an adapted manual of sampling, cleaning, isolation and maintenance of seaweed. Several native species of seaweed isolated and added to Spanish and European catalogues. Genetic identification of biological material. Dissemination of project and results with promotional video and webinar .	2, 3, 6, 7, 8, 9, 10, 12	Environmental	£39,444	£39,444
2021	Sea Health (Australia)	Australia	Sea Health Products aims to introduce commercial-scale kelp farming to Australia by developing hatchery techniques for the development of the local seaweed industry.	The demand for Australian-grown seaweed and kelp has increased significantly in the past 5 years. Yet, there are no commercial-scale kelp farms in Australia, and hand-harvesting methods of storm-coast kelp are severely inadequate to meet the current and projected demand for seaweed.	Successfully scaled and improved laboratory to breed <i>Ecklonia radiata</i> (golden kelp) from 10 different locations in Australia. Gametophytes stored in a red room and now available for restoration and farming projects. Small trial conducted in open water and now growing adult plants .	3, 13, 14	Environmental & operational	75,000 AUD	None

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2021	Basilisk (Chile)	Chile	Universidad Austral de Chile aspires to characterize and biobank pests and pathogens of pelillo to develop tools that will aid in risk management as related to biosecurity.	Pests normally reduce growth and lifespans of hosts after overgrowing them. They may cause loss of chemical composition quality and of resistance to environmental stressors. However, there is no clarity about the characteristics of these pest species, as well as the drivers that have caused their emergence. For the same reason, there is no efficient way yet to predict outbreaks, diagnose diseased stocks, or accurately estimate the prevalence of these pests in culture.	Isolate and characterize molecularly and morphologically relevant pests and pathogens for <i>A. chilensis</i> . Characterize <i>A. chilensis</i> eukaryome , along different systems and successional stages in culture. Generate epidemiological data in <i>A. chilensis</i> cultures for most relevant pests, and correlate it with environmental data and farm practices. Generate and divulge an <i>A. chilensis</i> policy brief for farmers, other stakeholders, and policymakers.	1, 5, 9, 14, 17	Environmental	49,896	24,490
2021	Natural Cracking (France)	France	Aber Actives is developing an algal biorefinery using natural marine bacteria.	Biorefinery protocols still aren't compatible with all markets (e.g. cosmetics), because these expression systems make use of genetically modified organisms (GMOs).	Harvested 3 brown algal species and prepared algal powders sufficient for the entire duration of Natural Cracking. Confirmed main hypothesis: a marine bacterium can be used as a "tool" to extract and release compounds in solution from an algal, solid biomass. Defined a first optimized protocol for "natural" compound extractions. Demonstrated that the inducer (e.g. algininate) in the bacterial pre-culture step is not needed to improve the capacity of the model marine bacterium to extract compounds from algal biomass.	9, 12, 14	Operational	50,000	None
2021	Coalition for Safe Seaweeds in the Americas (Chile)	Chile, USA and Brazil	Join efforts of interested parties within the Americas to discuss and evaluate real-world, solutions-based applications of science and technology related to all aspects of safety and sustainability for the production and processing of seaweeds in the Americas and globally	The networking amongst the countries of the collective Americas is a fundamental requirement for the further sustainable development of the varied seaweed industries.	Establishment of the Coalition for Safe Seaweed in the Americas. Development of one standard protocol for proximal composition of the main commercial seaweeds from Chile, USA and Brazil. Evaluation of problems in the production chain in Americas.	1, 2, 8, 9, 10, 12, 14, 15	Consumer	40,000	19,509

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2022	Blue[i]weed (New Caledonia & France)	South Pacific region	A South Pacific Seaweed Working Group aims to address seaweed safety issues and propose common standards.	There are safety issues and a lack of standards that hinder the development and diversification of the seaweed industry in this region. The untapped diversity of available native species may offer many opportunities for value-added products.	Regional database on heavy metals, iodine and pollutants in seaweeds of the South Pacific. Common safety standards proposal for heavy metals, iodine and pollutants in South Pacific seaweeds. List of safe seaweed species for food and feed in the South Pacific. Recommendations on the safest seaweed valorisation opportunities for the South Pacific region. Species information booklet.	2, 3, 12, 13, 14	Consumer (food safety)	50,000	48,316 (81,675 if in-kind included)
2022	Ocean data for a sustainable seaweed production (Madagascar)	Madagascar – Sainte Marie Island	Nosy Boraha Seaweed (NBS) in Madagascar is working on the development of an innovative solution to increase sustainability of Kappaphycus farming using digital technology and data collection, and to eventually understand the contribution of seaweed farming as ecosystem services.	At a global level, kappaphycus sp. farming is becoming more and more challenging, mainly because of climate change. Understanding the environmental variables having an impact on seaweed behavior in real time and making sure the information is available in a friendly manner to producers will be a significant innovation to anticipate risks and take good decisions when managing the farms.	Characterize environmental conditions in seaweed production areas and variations over time to evaluate their potential to develop the activity. Identify links between seaweed behavior, appearance of disease outbreaks, and environmental conditions to develop a risk management approach to seaweed production that can be deployed globally. Develop affordable and modern solutions to analyze environmental conditions in real time and mitigate production risks. Spread solution to multiple areas for increased level of accuracy . Evaluate ecosystem services seaweed farming provides through real time monitoring of environmental variables. Build a strong database of ocean data to help measure climate change impact over time and evaluate possible impact on seaweed farming and marine ecosystems. Develop a global network of similar solutions to create a powerful tool to help seaweed producers and entrepreneurs.	1, 2, 5, 8, 12, 13, 14, 17	Operational, environmental and livelihood	49,872	54,750 (in kind)

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2022	Tahaleb Project (Tunisia)	Tunisia	The aim of TAHALEB is to enhance capacity of the Institut National des Sciences et Technologies de la Mer (INSTM) in seaweed production, for the institute to be the driving force of development of this sector in Tunisia and the Mediterranean Sea region.	Seaweeds from Tunisian coasts are a valuable resource with a high potential for industrial purposes. Thus, there is a need for seaweed cultivation to manage a sustainable blue economy based on industrial usage of macroalgae in this region.	Exchange of expertise with project partners. Implementing seaweed cultivation infrastructure at the National Institute of Marine Sciences and Technologies. Know-how transfer through training and workshop.	1, 2, 3, 8, 9, 12, 13, 14	Environmental	50,000	2,000
2022	Safe Post-Harvest for the Kelp Industry (USA)	USA	GreenWave in USA is developing and promoting safe post-harvest handling packaging, storage best practices, and resources for kelp farmers and other industry stakeholders.	There are currently barriers to help industry growth, mainly access to market and ensuring safe delivery of kelp products to stakeholders across the supply chain.	White paper on Sugar Kelp Respiration Rates & Implications for Post-Harvest Handling and a Fresh Sugar Kelp Packaging Resource. Resources promoted through GreenWave's Ocean Farming Hub; a January 2023 Optimal Post-Harvest Handling & Storage webinar (44 live attendees, 52 asynchronous access); and a Harvesting Value workshop, held in June 2023 as part of a 3-day, in-person training for 17 farmers. Findings from studies on salt and iodine reduction, storage conditions, and bio-fouling removal to be shared including through October 12, 2023 webinar.	8, 12, 13, 14	Consumer (food security)	50,000	\$29,675

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2022	SafeSeaweedRelief Project (Australia)	Philippines	Coast40 in Philippines will pilot a proven typhoon-resistant platform as a sea-based nursery to accelerate biomass recovery of high-quality seedlings in the aftermath of super typhoon Rai (Odette).	Securing sufficient seedstock following events such as typhoons is challenged by the scale of damage and causal climatic conditions that affect production regionally.	Typhoon-resilient platform established as nursery for rebuilding biomass in Bohol post-Odette. Growth rates of different cultivars on the platform compared to growth rates in standard nursery models. Cost-benefit analysis and protocols for operating this technology as a means to enhance climate resilience. Seedling biomass distributed to seaweed farmers to rebuild livelihoods affected by Odette.	1, 2, 5, 11, 12, 13, 14	Operational	50,000	Not available at time of report
2022	MWANI SAL-AMA Project (Tanzania)	Tanzania	HealthySeaweed Co. Limited in Tanzania aims at assessing nutritional value and potential risks of seaweed and seaweed-based foods made in Tanzania, to increase safety and wellbeing for its consumers.	The nutritional values and safety levels required for human consumption of seaweed and its processed products are still not known.	Nutritional value and potential risks in seaweed and seaweed-based foods in Tanzania assessed by quantifying micronutrients and heavy metals levels. Scientific publications in the Journal of Phycology (under review), manuscript to inform policymakers. Built capacity of 100 public and private seaweed food processing stakeholders on nutritional value and potential risks in seaweed and seaweed-based foods, in both Zanzibar and Mainland. Produced educational videos on nutritional benefits of well processed seaweed to increase public awareness and consumption of safe and well processed seaweed in the country. Recognition by World Economic Forum.	2, 3, 9, 12	Consumer (food safety)	49,290	\$30,000 (in kind contribution) and Seaweed Cafe Contribution

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2022	Ocean Approved, Inc. (DBA Atlantic Sea Farms) (USA)	USA	Atlantic Sea Farms will test for heavy metals and nutritional variances at 27 farms over an entire growing season spanning a distance of over 325 km and four natural embayments to inform site selection to minimize heavy-metal uptake and nutritional density on future farms.	As fast-growing autotrophs, seaweeds bioaccumulate heavy metals at levels commensurate with the environment and are some of the most nutrient-dense foods on the planet. The dynamic nature of the marine environment makes it difficult to anticipate heavy metal and nutritional content without better data.	Test 27 farms over 325 km growing distance for variances and carry out comparison to determine optimal growing locations, strains, and timeline for harvest.	2, 3, 11, 13, 14	Consumer (food safety)	50,000	In-kind match
2022	MERISTO Project (Senegal)	Senegal	Senegalese Institute for Agricultural Research (SIRA) will improve processing and cultivation of the rhodophyte Meristothoea senegalensis, a good source of iodine and carrageenan, to drive further developments in the local seagriculture.	Given the recognized high diversity and harvested algal stocks on the Senegalese coast, there is a growing interest in the development and implementation of macroalgal cultivation in the region.	Co-creation of cultivation methods . Identify influence of site, season, and processing on iodine and trace metal content and nutritional components. Comparison of eDNA samples with those of prior project CLIMALG-SN. Network and exchange through global partnerships and connection with Zanzibar Seaweed Cluster Initiative. Maintain and foster seaweed sector in Africa through knowledge and skill sharing and provision, especially women.	1, 2, 3, 5, 8, 10, 12, 13, 14	Consumer & livelihood	50,000	25,000 (Project LIMALG-SN)

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