

Plan to Accelerate

Multiple Benefits of Algae Aquaculture

Host initiative: **United Nations Global Seaweed Initiative (UNGSI)**

Secretariat: UN Trade and Development (UNCTAD) and Global Seaweed Coalition (GSC)

01 PAS Overview

AXIS 3. Transforming Agriculture and Food Systems	KEY OBJECTIVE 9. More resilient, adaptive, and sustainable food systems	SOLUTION Multiple benefits of algae aquaculture
HOST INITIATIVE(S)	United Nations Global Seaweed Initiative (UNGSI)	
SECRETARIAT	UN Trade and Development (UNCTAD) and Global Seaweed Coalition (GSC).	
COOPERATING ENTITIES	UN Global Compact (UNGC), UN Industrial Development Organization (UNIDO), Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO IOC), Food and Agriculture Organization of the United Nations (FAO), UN University (UNU), International Trade Centre (ITC).	
PAS LAST UPDATED IN	September 2026	

Overall PAS Scope

GEOGRAPHIC Global, regional and national, with implementation focused on relevant algae-producing, processing and trading countries.	SECTOR(S) Algae and seaweed aquaculture; aquatic food and non-food production; processing and value chains; trade; biomaterials; agricultural bio-inputs; climate adaptation and mitigation; biodiversity; and coastal development.
STAKEHOLDER GROUPS Governments; algae and seaweed producers; small-scale farmers; businesses and SMEs; financial institutions and investors; regulators and public agencies; technical and research institutions; standards and conformity-assessment bodies; civil society organisations; Indigenous Peoples and local communities; and multi-stakeholder platforms.	INCLUSION FOCUS Women; youth; small-scale algae and seaweed producers; Indigenous Peoples and local communities; coastal communities; SMEs; and producers in SIDS, LDCs and other developing countries.

02 Implementation Levers Assessment

PAS TEMPLATE GUIDANCE Assess maturity; reflect in rationale key systemic barriers preventing implementation and explain briefly how the PAS intends to address the levers as described in the [PAS Terms of Reference](#). Where possible, base the assessment on authoritative sources (e.g. IPCC, UNFCCC, IEA, Breakthrough Agenda, State of Climate Action and sectoral reports)

MATURITY AT A GLANCE			 Low  Medium  High		
Policy and regulatory frameworks		Low	Supply		Medium
Risk and market decision-making		Medium	Demand		Medium
Technology shifts		Medium	Trade		Medium
Knowledge & capacity building		Low	Public/private finance		Low
Inclusive decision-making governance & design		Low	Partnerships and collaboration		Low
Standards and Taxonomies		Low	Public opinion		Medium
6 of 12 levers are assessed at low maturity and 6 at medium maturity.					

01 Policy and regulatory frameworks

MATURITY  Low

Algae remains poorly defined in production, trade, regulation and standardisation systems, which are fragmented across food and non-food applications among different sectors. At the national level, seaweed is usually governed under fisheries, aquaculture, or food laws, with dedicated algae regulations mainly in Asian countries. At the regional level, efforts are limited and inconsistent with the exception of the European Union. There is no dedicated multilateral agreement specifically covering algae. General technical guidance exists on adaptation and integration into NDCs/NAPs/NBSAP, but adoption is uneven. Countries are increasingly integrating fisheries and algae aquaculture into national policies, but coherence across climate, biodiversity, industrial development, marine and coastal zone management and food security agendas remains limited. UNCTAD's latest research reveals that SIDS have placed the ocean at the heart of their NDCs. Across 39 countries, a total of 606 ocean-related measures were found in NDCs: 54 per cent prioritize sustainable ocean economies, while 46 per cent target marine and coastal ecosystem conservation. About 85 per cent of the measures on sustainable use focus on fisheries and aquaculture, with only limited explicit attention to algae (UNCTAD, 2024).

02 Risk and market decision-making

MATURITY  Medium

Genetic impoverishment poses a significant risk in seaweed farming, as it increases crop vulnerability to diseases and pests. This issue is particularly evident in tropical red seaweeds such as *Eucheuma* sp. and *Kappaphycus* sp., which were introduced from the Philippines to regions in East Africa and Central and South America. Although the sector has expanded rapidly, production practices still rely heavily on monocultures and vegetative reproduction (cloning). To strengthen resilience and sustainability, greater emphasis should be placed on identifying and preserving in genebanks local species and cultivating them within multi-culture systems. Conservation and restoration of wild seaweed ecosystems are equally critical to maintain genetic diversity, safeguard ecosystem functions, and support the sector's long-term sustainability. High climate vulnerability and safety risks to algae aquaculture are well recognized, but systematic use of climate data, early warning systems, and adaptive management tools for farmers remains limited, especially in developing countries and among small-scale producers and women. While new start-ups and small and medium enterprises (SMEs) are emerging in seaweed production and processing, informality in operations and decision-making is widespread. There is also a lack of international, regional and national intelligence and data systems on seaweed markets and product quality, limiting

producers' ability to negotiate equitable contracts with sourcing companies and participate competitively in global value chains (UNCTAD, 2026).

03 Technology shifts

MATURITY  Medium

Proven technologies for seaweed production and application exist - from mariculture and recirculating aquaculture systems to extraction of commercial biochemicals such as agar, alginate, and carrageenan. Successful organizational models are ready to be replicated in anticipation of technological shifts, particularly in cultivating red tropical seaweed. Community-based farming has already demonstrated its success, increasing production from 0 to 2,000 tons of dry seaweed in less than five years. UNCTAD reports that global exports of agar and alginate reached USD 272 million and USD 194 million, respectively, in 2022 (UNCTAD, 2026). Technology transfer mechanisms are necessary to persuade adoption of climate resilient technologies by seaweed producers. Successful integration of small scale producers in industrial value chains is necessary to guarantee increased income for farmers (UNIDO, 2019). In parallel, scalable nature-based technologies like integrated multi-trophic aquaculture (e.g., shrimp–tilapia–seaweed or finfish–bivalve–seaweed or abalone–seaweed or oyster–seaweed) support ecosystem services such as carbon absorption, pollution mitigation, habitat provisioning and coastal acidification mitigation. These innovations have shown clear adaptation and environmental benefits; however, scientific data still need to be replicated and harmonised to confirm their consistency. Additionally, potential bottlenecks for technological uptake need to be considered, including licensing, energy requirements, and human capacity constraints. The Nature Conservancy (TNC) developed a framework to measure the impact of seaweed farming (2024) and initiated this effort, which the Global Seaweed Coalition has since followed in developing approaches to assess biodiversity impacts. Still, progress on sustainable seaweed solutions across food and non-food sectors remains hindered without enhanced access to investment and broader deployment.

04 Knowledge & capacity building

MATURITY  Low

Around 600 million people rely on aquatic foods for livelihoods, yet many seaweed producers lack access to climate finance literacy and training on climate-resilient practices. Extension services remain uneven, and local and traditional knowledge must be mobilized to guide adaptation. In 2024, global seaweed production reached 38.9 million tonnes of algae (including seaweed and microalgae) (wet weight), valued at USD 19.9 billion, yet commercial cultivation is concentrated in only 10 species, limiting diversity and resilience (UNCTAD, 2024). These 10 species account for 99% of global seaweed production, according to the FAO's FishStat database (FAO Stats, 2025); three species represent 74% of global production. Seaweeds contribute to food security, women's economic empowerment, and climate benefits, but producers often lack access to finance, training, and global markets (UNCTAD, 2024). UNCTAD's regulatory mapping of seaweed trade and standards also highlights uneven knowledge and fragmented approaches across regions. Building capacity for producers, especially women and small-scale farmers, and sharing best practices are essential to unlock these benefits (UNCTAD, 2024; GSC, 2026). Knowledge, skills and capacity of seaweed producers and processors in developing countries to supply new markets such as biostimulants, animal feed, pet foods, non-plastic substitutes, and methane-reducing additives remain limited and need to be strengthened (UNCTAD, 2024 and 2026). UNIDO's SMART-Fish and Global Quality and Standards Programme in Indonesia (since 2014) provide an operational precedent for integrating small-scale seaweed producers into industrial value chains through traceability, quality and standards compliance and processing upgrades (UNIDO, 2019 and 2023).

05 Inclusive decision-making governance & design

MATURITY  Low

Co-management models show promise, yet small-scale and Indigenous actors remain underrepresented in decisions affecting their climate resilience. Women make up more than half of the seaweed workforce in several producing countries, but their participation in governance and policy processes remains limited (UNCTAD, 2024). UNCTAD's Ocean of Opportunities report stresses that small-scale producers are critical actors in farming and processing, yet often operate informally with limited institutional recognition (UNCTAD, 2024). The seaweed sector lacks gender-disaggregated production data, despite broad recognition that women make up a significant share of the seaweed workforce. The UN Global Seaweed Initiative (UNGSI) seeks to address this by embedding inclusive governance structures that ensure women, youth, and small-scale producers help shape regulatory standards, trade access, and climate resilience strategies. Potential impacts will depend on the level of maturity of the

governance structure. Seaweeds are often grown in shallow coastal waters, an ecosystem that is among the most vulnerable to climate change and biodiversity loss. Seaweed cultivation should therefore be carefully designed and well integrated into coastal adaptation planning, particularly through locally led adaptation.

06 Standards and Taxonomies

MATURITY  Low

There is no internationally recognized trade classification or taxonomy for edible industrialized algae. To date, the Codex Alimentarius lacks comprehensive guidance on seaweeds. The first process to formulate global standards for edible algae—beginning with 'Nori'—was officially initiated at the 49th Session of the Codex Alimentarius Commission (CAC49) in July 2026, with the active participation of UNGSI Member States. In trade statistics, seaweed and its derivatives are covered under a small number of HS codes: HS 1212.21 (raw seaweed for food use), HS 1212.29 (raw seaweed for non-food use), HS 1302.31 (agar-agar), and HS 3913.10 (alginic acid) (WCO, 2022; UNCTAD, 2024). This narrow classification constrains visibility in global trade data and hinders harmonisation of regulatory approaches. A science- and economy-based taxonomy for commercial seaweed species is needed. Private sustainability standards (e.g. ASC seaweed) exist but remain limited to primary and large-scale production. Greenhouse gas inventory and life cycle assessment methods for seaweed farming also exist, but require further standardisation to fully capture carbon mitigation and biodiversity co-benefits.

07 Supply

MATURITY  Medium

Over the past two decades, the global seaweed industry has tripled in size and doubled in value. Today, seaweed accounts for half of global marine aquaculture production by volume. Main producers of primary algae are in Asia, with China and Indonesia generating 87 per cent of global seaweed production in 2022 (UNCTAD, 2026). In the short term, the most promising new markets are projected to reach \$4.4 billion by 2030, including biostimulants, animal feed, pet foods, and methane-reducing additives. Medium-term opportunities, including nutritional supplements, alternative proteins, bioplastics, and fabrics could reach a potential value of \$6 billion. Long-term emerging markets are projected to reach \$1.4 billion for pharmaceuticals and construction materials, but face significant regulatory challenges and high product-development costs (World Bank, 2023). External experts consider FAO production data not fully accurate. National focal points to obtain those data are not clearly designated. When preparing supply-side data, it is necessary to consider climate and other environmental risks that could generate quite different output levels.

08 Demand

MATURITY  Medium

Seaweed demand has been mainly driven by aquaculture growth; increased demand for low-calorie, nutritious, low-carbon and plant-based diets; and new non-food uses including in biostimulant, animal feed, fertilizers, biopackaging and cosmetics, bioplastics, but this trade is currently subject to significant tariff and geopolitical uncertainty that will affect trade flows (UNCTAD 2024 and 2026). Demand should grow organically as global food demand rises and synthetic fertilizer price increases due to multiple security and climate crises. Using UN population estimates for the next few decades, we would expect total dry-weight seaweed demand to increase by 20% between now and 2050 (Standard Chartered report, 2023). Finally, demand is expected to grow through increased awareness and education, which remain limited at present and are not yet integrated into national policies.

09 Trade

MATURITY  Medium

Trade in seaweed and other algae, whether fit for human consumption (HS 121221) or other uses (HS 121229), nearly took a 4-fold growth between 2012 and 2022, rising from 1 billion to \$3.9 billion. Asia and Latin America are the top exporters. Many countries are now exploring South-South and regional trade as options to deflect impacts of tariff uncertainty and to find new markets (UNCTAD, 2026). Seaweed has not yet been fully recognised as a plant-based commodity in international markets. The 5th United Nations Ocean Forum on Trade-related aspects of SDG 14 called for the creation of a UN-wide task force on seaweed and a Technical Advisory Body on sustainable biomaterials within UNCTAD to fill regulatory and standard gaps and scale up marine-based innovation and related product development (UNCTAD, 2025). The national quality infrastructure system (standards, metrology,

conformity assessment services) is often underdeveloped and not equipped to serve the seaweed sector. As a result, verifying compliance of products with quality, safety and sustainability requirements becomes difficult and costly, thus hindering trade.

10 Public/private finance

MATURITY  Low

Seaweed aquaculture remains critically underfinanced compared to its potential. While global seaweed exports were valued at around USD 3.9 billion in 2022, the overall market is estimated at beyond USD 19 billion, revealing a major investment gap (UNCTAD, 2024a, UNCTAD 2026). Despite its role in food security, climate mitigation, and sustainable materials, seaweed receives only marginal attention from global adaptation and agrifood finance flows (GSC and EIB, Unlocking the Potential of Europe's Seaweed and Bivalve Industries, 2025). UNCTAD's Blue Deal initiative (2023) highlights the need to mobilise blue finance for emerging ocean sectors, including seaweed, through instruments such as blended finance, blue bonds, and sustainable trade facilitation. Unlocking this financing is essential to expand production, foster innovation, and ensure inclusive participation in seaweed value chains. GSC has identified blended funds as one solution to derisk investment. Indeed, seaweed producers and SMEs have difficulty fundraising to kick-start projects; they are typically characterized by long-term return on investment and being cost-intensive when production is on land. A scoping study is being initiated at EU level with identified partners; it would be desirable to scale it up to the global level if funds are available. In parallel, public funding is needed to safeguard national seaweed resources and support restoration efforts. Countries therefore need to secure their national resources through the establishment of seaweed genebanks - both to preserve biodiversity and, more importantly, to protect and sustain their growing seaweed industries, which currently rely on a limited number of species. UNGSI is proposing a multi-country GEF-9 operation to provide financing for countries in four broad areas: (i) policy and governance; (ii) scientific research, innovation and biosecurity; (iii) trade, production and finance technical cooperation and capacity building; and (iv) climate adaptation and ecosystem advocacy; the operation is led by UNIDO and FAO at the program level and UNCTAD, UNESCO IOC and GSC provide design and implementation support. Adaptation finance is beginning to reach seaweed-farming communities, including through the UNIDO-implemented Adaptation Fund project in Tawi-Tawi, Philippines (USD 10 million, approved 2025, under implementation) and the GEF-8 LDCF SeaBlue project in Madagascar (USD 5 million, PIF approved 2026, under preparation).

11 Partnerships and collaboration

MATURITY  Low

Collaboration among science, finance, policy, and communities, as well as multi-stakeholder initiatives, are growing, though continued co-design and scaling are needed for greater impact. The UNGSI demonstrates this lever by bringing together Member States (Belize, Brazil, Chile, France, Ghana, Indonesia, the Republic of Korea, Madagascar, Senegal, Seychelles, the Bolivarian Republic of Venezuela) and supporting technical partners including UN entities (UNCTAD, UNGC, FAO, UNIDO, UNESCO IOC, UNU, ITC), and GSC. This multi-stakeholder coordination platform provides a foundation for scaling collaboration, joint research, knowledge exchange, and investment in algae aquaculture. In science, UNGSI supports the emergence of regional seaweed research centers (e.g. tropical seaweed research center in Indonesia covering research for SE Asia and East Africa). GSC's collaboration with UNGSI and its partners on the one hand, and the authors of the Seaweed Breakthrough on the other, facilitates an important connection between the efforts to support economic development of the sector and to halt loss, protect, and restore seaweed habitats.

12 Public opinion

MATURITY  Medium

Recognition of seaweed as a low-carbon, nutritious, and versatile resource is growing, but its role as a climate and development solution remains underrepresented in public narratives. Despite its potential to support food security and provide ecosystem services and substitutes and alternatives to plastics, seaweed is still perceived as a niche commodity rather than a strategic sector. In the case of substitutes and alternatives to fossil fuel-based plastics, seaweed is already being used to develop and produce biomaterials such as PLA and PHA, with no microplastics in the latter. UNCTAD and GSC helped shift narratives by framing seaweed as both a climate and development solution at the 5th UN Ocean Forum (March 2025) and the 3rd UN Ocean Conference (June 2025). The UNGSI builds on this momentum by offering a platform for awareness-raising, advocacy, and public engagement on seaweed's role in food security, livelihoods, and climate action. At the same time, negative public opinion persists

around the disruptions caused by blooms of species such as sargassum, which is widely associated with beach fouling and coastal damage, rather than being recognized for its potential uses if managed sustainably.

03 Expected Contribution and Impact (through 2035)

PAS TEMPLATE GUIDANCE Describe how the PAS contributes to the relevant 2030 Climate Solutions, GST outcomes, GGA, SDGs and other frameworks, including expected KPIs where available.

POLICY AND REGULATORY FRAMEWORKS

Strengthen coherence across national, regional, and global levels by advancing international classifications (HS codes), regulations (national laws) and standards (e.g. Codex Alimentarius, ISO and ASC, and IPCC Guidelines for reporting seaweed farming in National Greenhouse Gas Inventories). Mapping existing regulations and standards and providing technical assistance for dedicated improvement, refinement and compliance. Algae will be better integrated into NDCs, NAPs, and NBSAPs, particularly in SIDS and coastal states, ensuring alignment across climate, biodiversity, and food security agendas.

FINANCE AND INVESTMENT

Unlock capital flows for seaweed aquaculture through blended finance models, blue bonds, and sustainable trade facilitation. Scale up the EU-led scoping study on blended funds into a global initiative to de-risk private investment and expand opportunities for SMEs and small-scale producers. Mobilize public financing to strengthen policy development and sector governance; strengthen scientific research and applications including establishing national seaweed genebanks to ensure biodiversity conservation and long-term resilience of the sector; support technical cooperation and capacity building; and support climate adaptation and ecosystem advocacy. Clarification of more suitable and sustainable cultivation methods, safety, job creation and technological needs could facilitate leveraging impact capital opportunities.

KNOWLEDGE, CAPACITY, AND INCLUSION

Expand training and extension services, focusing on climate finance literacy, trade-related policies, resilient practices, and mobilizing traditional knowledge. Replicate successful organizational and community-based farming models that have already demonstrated rapid scaling potential, such as red tropical seaweed cultivation. Strengthen inclusive governance, ensuring meaningful participation of women, youth, and Indigenous producers in shaping policies, accessing markets, and benefiting from investment.

DATA AND EVIDENCE

Improve the quality, harmonisation, and accessibility of seaweed production and trade data to support evidence-based policymaking and investment. FAO's FishStat provides global production statistics, though coverage is limited to a handful of species. UNCTAD and UN Comtrade track trade flows in values and volumes on existing raw materials and by-products. Building on these foundations, the plan will seek to enhance global monitoring systems, ensuring that SIDS, LDCs, women and small-scale producers are visible in statistics, and able to leverage opportunities in the seaweed sector in a sustainable ocean economy.

Impact pathways to 2035

By 2035, the plan aims to deliver measurable progress through three impact pathways:

1

Increasing uptake of best climate mitigation, adaptation and resilience practices and technologies

By expanding sustainable cultivation and processing, deploying innovations such as methane-reducing feed additives, biostimulants for agriculture, disease and climate-resilient strains, improved farming systems, and digital monitoring tools.

2

Strengthening governance and inclusive participation

By integrating seaweed into NDCs, NAPs, NBSAPs and national ocean, food and climate strategies, while ensuring active involvement of smallholders, women, youth, and Indigenous producers in policy, market access, and benefit-sharing.

3

Mobilizing finance for aquatic food systems transformation

By scaling public and private investment, de-risking SME participation through blended finance, and supporting infrastructure for new value chains in bioplastics, fertilisers, pharmaceuticals, and other innovative applications. Fund the “Blue deal” proposal by UNCTAD to provide a sector-wide support to the implementation of trade-related aspects of SDG 14 and action by the UNGSI.

Expected contributions to global processes

Global Stocktake (GST)	Highlights seaweeds’ role in mitigation (carbon absorption, methane reduction, plastic alternatives) and adaptation (ecosystem regeneration, coastal protection), filling a current gap in climate reporting on blue carbon ecosystems.
2030 climate solutions targets	Demonstrates how seaweed can support nutrition security, resilient coastal livelihoods, and low-carbon materials for billions in climate-vulnerable regions, while attracting new flows of green and blue investment.
SDGs	Directly contributes to SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action) and SDG 14 (Life Below Water).
UN ocean and climate processes	UNGSI responds to the recommendations of the 5th UN Ocean Forum (March 2025), building on its announcement at the 3rd UN Ocean Conference (June 2025) and its launch at UNGA (September 2025), providing a global platform to strengthen governance and finance for seaweed. It will continue this trajectory at COP31 (November 2026), positioning seaweed within sustainable ocean economies and trade contributions to national climate action and biodiversity frameworks, with strong relevance for SIDS, LDCs, and emerging producer countries.

**FURTHER INFORMATION**

For further information on the UNGSI objectives, membership, areas of priority and activities please see:

<https://unctad.org/topic/trade-and-environment/united-nations-global-seaweed-initiative>

<https://www.safeseaweedcoalition.org/ungsi/>

04 Implementation Roadmap

PAS TEMPLATE GUIDANCE: COLUMN DEFINITIONS

Output and Description: The concrete deliverable. Include a brief description

Action: Action to be implemented that contributes to the output

Action Scope: Sectoral, people-centred and/or enabling (finance, technology, capacity, policy, etc.).

Action Status: Indicate whether this action is existing, new, or completed under the PAS delivery milestone.

Countries: Countries where implementation will take place (if known).

Implementation Levers: Select the relevant implementation lever(s).

Output Lead Entity: Organisation(s) accountable for output delivery.

Output Delivery Partners: Partners already committed to implementing the output.

Stakeholders to Mobilise: Additional targeted stakeholders needed to scale implementation. E.g., Countries / Companies / Investors / Cities and local governments / Technical institutions / MDBs / Regulators & Public agencies / Utilities & System operators / Gender/Youth & Indigenous Groups / Multi-stakeholder platform

Delivery Milestone: Select one: November 2026, June 2027, November 2027, June 2028, November 2028

Geographic Scope: Indicate if the output scope is relevant at global, regional or local level.

Output and Description	Action	Action Scope	Action Status	Countries	Implementation Levers	Output Lead Entity	Output Delivery Partners	Stakeholders to Mobilise	Delivery Milestone	Geographic Scope
01 Develop a methodology for the inventory of GHG emissions and removals from macroalgae aquaculture. // Drafting of a proposal for IPCC Guidelines for reporting seaweed farming in National Greenhouse Gas Inventories	Strengthen FAO–IPCC Co-Sponsored Expert taskforce established to support the IPCC Seventh Assessment Report process (AR7) by synthesizing the latest science on agriculture and food systems under climate change, including algaculture, and proposing guidelines for reporting seaweed farming in National Greenhouse Gas Inventories.	Global aquatic plant systems	New action	12 (in Brazil, the initiative is led by the Brazilian Agricultural Research Corporation - EMBRAPA)	Knowledge & Capacity building Standards & Taxonomies	FAO/IPCC	UNGSI	Countries Technical institutions Multi-stakeholders platform	November 2027 (COP32)	Global
02 Achieve 100% growth in global seaweed aquaculture output by 2030 compared with previous decade	Promote adoption of climate-resilient production and technologies, pluri-culture practice and sustainable seaweed aquaculture models (ex: community based farming models). Facilitate the use of area-based management tools such as marine spatial planning (MSP) and marine protected areas (MPAs) UNIDO – Madagascar (approved PIF; under preparation): GEF-8 Least Developed Countries Fund (LDCF) project “Climate Resilient Seaweed Blue Economy in Madagascar (SeaBlue)” — climate-resilient seaweed production and value chains in five coastal regions; USD 5.0 million LDCF financing; Project Identification Form approved June 2026; project preparation under way towards CEO Endorsement targeted for 2027, at which point LDCF financing becomes operational. UNIDO – Indonesia (existing/ongoing): since 2014, through Sustainable Market Access Through Responsible Trading of Fish SMART-Fish Indonesia (2014–2019) and the Global Quality and Standards Programme (GQSP)	Global aquatic plants systems	Existing action	Indonesia (UNIDO GQSP) Madagascar (UNIDO GEF-8 LDCF SeaBlue) Philippines – Tawi-Tawi (UNIDO Adaptation Fund)	Supply Technology shifts Knowledge & Capacity building	FAO, UNIDO, UNCTAD, GSC, UNESCO IOC	UNGSI	Countries Companies Investors Technical institutions	November 2028 (COP33)	

Output and Description	Action	Action Scope	Action Status	Countries	Implementation Levers	Output Lead Entity	Output Delivery Partners	Stakeholders to Mobilise	Delivery Milestone	Geographic Scope
	Indonesia Phase I, 2019–2023; Phase II, October 2023–December 2026), funded by Switzerland (SECO) and implemented with the Ministry of Marine Affairs and Fisheries and the National Standardization Agency, UNIDO supports upgrading of Indonesia's seaweed value chain: sustainable cultivation practices, productivity and quality, development of new cultivated species and products, traceability (SeaweedTrace), SME processing and value addition, and market access. Phase II places specific emphasis on new seaweed species for coastal livelihoods and on the sector's contribution to climate change mitigation and adaptation. UNIDO – Philippines (approved; under implementation): Adaptation Fund project “Harnessing the Water-Energy-Food Nexus to Address and Adapt to Climate Change Impacts in Tawi-Tawi” (USD 10.0 million; approved April 2025; implementation 2026–2030; UNIDO as Implementing Entity with the Mindanao Development Authority) — climate-resilient water access for seaweed-farming communities in Sibutu and Sitangkai, with a livelihoods component supporting adaptation and diversification of seaweed farming, local value addition and market linkages									
03 A preliminary map of algae and seaweed trade regulations and standards is available	Undertake a preliminary mapping of trade regulations and standards	Global aquatic plant trade	Completed action		Trade Policy & regulatory Knowledge & Capacity building Standards & Taxonomies	UNCTAD-led, with the support of GSC, UNIDO, FAO, ITC	UNGSI	Countries Companies MDBs Technical institutions Regulators & Public agencies Multi-stakeholders platform	November 2026 (COP31)	
04 Increased number of references in NDC 3.0, NAPs, and NBSAPs or associated implementation plans that explicitly include algae-related actions and priorities	Further develop technical guidance and evidence on the climate mitigation and adaptation potential of aquatic food systems, and support countries to integrate algae in NDCs, NAPs and NBSAPs. Support the integration of algae aquaculture into Marine Spatial Planning (in progress, led by UNESCO).	Global aquatic plant aquaculture and carbon sinks contribution to climate, adaptation and biodiversity goals	Existing action		Policy & regulatory Trade Technology shifts Knowledge & Capacity building	UNFCCC-led with the support of UNCTAD, FAO, UNIDO, UNESCO IOC, GSC, UNU, ITC	UNGSI	Countries Technical institutions Multi-stakeholders platform	November 2027 (COP32)	

Output and Description	Action	Action Scope	Action Status	Countries	Implementation Levers	Output Lead Entity	Output Delivery Partners	Stakeholders to Mobilise	Delivery Milestone	Geographic Scope
05 Mapping of existing industrialised seaweed species globally at country level and associated genebanks. Taxonomy clarification is needed to enable the work.	Strengthen FAO AquaGRIS platform, create or identify genebanks at national level to secure seaweed production facing risks (climate event, pest & disease outbreak)	Global aquatic information system	Completed		Knowledge & Capacity building Standards & Taxonomies	GSC for FAO	UNGSI			
06 Develop and present scientifically sound reports to the Commission of the Codex Alimentarius to support the algae based standards for food and food contact.	Compile information on food grade species, food safety, nutrition, contaminants and other risks of relevant algae varieties. Further research might be needed to achieve this work. Share with UNGSI member states a policy brief on seaweeds as a nature-based solution to global iodine deficiency for their follow-up with the Codex. [done]	Global aquatic food systems	UNGSI recognised as an entity expert on seaweeds to attend and advise the Codex members	Brazil, France, and Madagascar	Standards & Taxonomies Risk-informed decision-making Policy & regulatory	FAO, UNCTAD, UNIDO, GSC	UNGSI	Investors Countries Companies Regulators & Public agencies	November 2027 (COP32) Next session of the CAC	
07 Assessment of various seaweed value chains and mapping value addition opportunities, compliance challenges and quality infrastructure needs for producer countries to be able to benefit from market opportunities.	Assessment of readiness of national quality infrastructure systems including institutional capacity (standardization body, metrology institution, accreditation body) and services (testing, certification, calibration, surveillance) to support development of seaweed industry and facilitate exports and trade. Assessment of markets and value chains to identify market and investment opportunities. UNIDO (existing/ongoing, with new assessment component): building on SMART-Fish Indonesia (2014–2019) and GQSP Indonesia (Phase I 2019–2023; Phase II 2023–2026), UNIDO has supported upgrading of Indonesia's seaweed value chain through improved production practices, quality and standards compliance, traceability, processing and value addition, SME development and market access, working with the Ministry of Marine Affairs and Fisheries, the National Standardization Agency and national quality-infrastructure service providers. Indonesia therefore serves as the initial pilot for a structured assessment of seaweed value chains, market and investment opportunities, compliance challenges and national quality-infrastructure capacities and services, with the approach to be adapted for other producer countries.	Global aquatic plant value chains and trade	Existing action Expanded with new assessment component (UNIDO Indonesia since 2014)	Indonesia as initial pilot (building on UNIDO SMART-Fish and GQSP experience since 2014)	Trade Policy & regulatory Supply Demand	UNIDO, FAO and UNCTAD-led with the support of UNGC-GSC, UNESCO IOC, ITC	UNGSI	Countries Investors Regulators & Public agencies Companies Technical institutions	November 2027 (COP32) 6th UN Ocean Forum	Global and specific country support
08 Global Innovation, Incubation and	Launch of global innovation challenge, connecting north and south actors for joint technology and product development, pilot testing and upscaling. Design and implementation of incubation and accelerator programme		New action		Technology shifts Trade	GSC, UNCTAD, UNIDO, FAO, UNGC, UNU	UNGSI	Countries Companies Investors	December 2030	

Output and Description	Action	Action Scope	Action Status	Countries	Implementation Levers	Output Lead Entity	Output Delivery Partners	Stakeholders to Mobilise	Delivery Milestone	Geographic Scope
Accelerator programme for development, pilot application and upscaling new seaweed based products and/or technologies	in collaboration with academia, industry and financial institutions. UNIDO (completed): under SMART-Fish Indonesia (2014–2019), UNIDO supported the establishment of the Tropical Seaweed Innovation Network, connecting researchers and businesses to bring innovation into the seaweed industry; under GQSP Indonesia Phase II, pilots with SMEs on new species and products (e.g. Ulva cultivation and processing, seaweed-based biostimulants) are ongoing. This experience is available to inform the design of the global innovation, incubation and accelerator programme.				Knowledge & Capacity building					
09 Enhancing education, training, sustainability, trade capacity and competitiveness of seaweed industries globally	Seaweed to be included as part of the educational curriculum. Design and implementation of a global technical cooperation programme aiming at 1) enhancing performance of all value chain actors through training, good practices, technology upgrading, up-skilling etc., 2) strengthening the technical and non-technical support institutions and services to the seaweed sector and 3) fostering a conducive policy environment for transformation of the seaweed sector in supported countries. The Seaweed Breakthrough , currently under development for COP31 , could serve as one of the key policy instruments to advance this last objective. UNIDO/FAO (under development): the multi-country GEF-9 global seaweed programme proposed under UNGSI (GEF-9 Global Seaweed Programme) is being developed by UNIDO and FAO, as lead GEF Agencies, in consultation with partners and interested countries in Africa and the Indian Ocean, Asia-Pacific, and Latin America and the Caribbean, as a potential financing pathway for this global technical cooperation programme; the Programme Framework Document is under preparation, and the programme remains subject to country endorsements and to GEF review and approval; it is not yet an approved or financed GEF programme.		Seaweed Breakthrough published and to be officially launched at COP31		Knowledge & Capacity building Partnerships and collaboration Public opinion	UNESCO IOC, GSC, UNIDO, FAO, UNCTAD, UNU, ITC	UNGSI	Countries Technical institutions Youth & Indigenous Groups Multi-stakeholders platform Companies	December 2035	
10 Leverage blue finance to enable smallholders, producers and SMEs to develop and innovate at production level and downstream valorisation.	Develop blended finance to de-risk seaweed investment. Enable micro-credit and social business model. UNIDO/FAO (under development): the proposed multi-country GEF-9 operation (Global Seaweed Programme) includes a dedicated access-to-finance and investment component covering blended finance instruments and private-sector engagement; under development and subject to country endorsements and to GEF review and approval, and not yet an approved or financed GEF programme.		New action In progress at EU level		Technology shifts Public/private finance	GSC, UNIDO, UNCTAD, FAO, ITC	UNGSI	Investors Countries Companies MDBs	November 2028 (COP33)	