

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

National stakeholder consultation on
transforming Indonesia's seaweed sector

Seaweed Value Chain Diagnostic: Transforming the Seaweed Sector in Indonesia

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➤ Introduction

▶ Context and Importance

- **Indonesia as one of the world's largest seaweed producers**
- Seaweed's role in:
 - Livelihoods of coastal communities
 - Export earnings
 - Environmental sustainability (coastal protection)
- **Global demand trends: food, cosmetics, pharmaceuticals, bio-packaging**



Objectives :

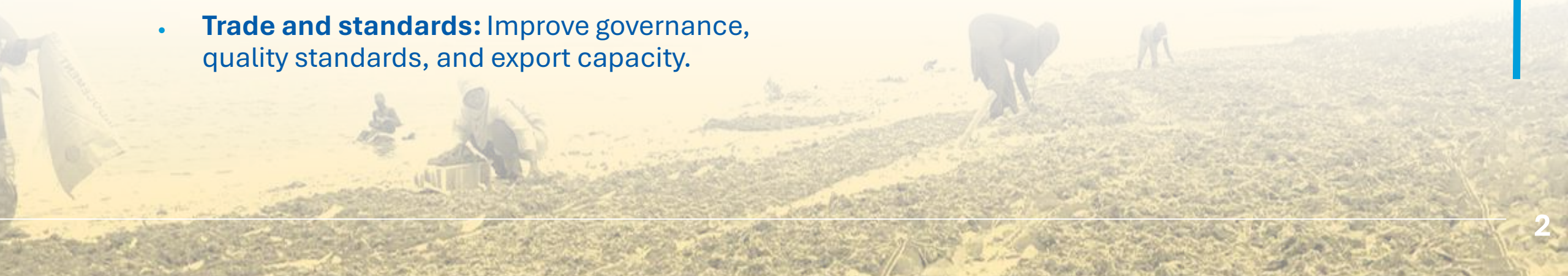
Contribute to Indonesia's RPJMN 2025 –2029 and the ISDAP 2026–2030 by **positioning seaweed as a strategic commodity under the green and blue economy priorities.**

Outputs :

- **Policy integration:** Support recognition of seaweed as a strategic commodity.
- **Production:** Strengthen downstream industry, diversify products, and enhance value addition.
- **Trade and standards:** Improve governance, quality standards, and export capacity.

Outcomes :

- **Alignment with *RPJMN* priorities** (agro-marine and downstream resource-based industries).
- **Direct contribution to ISDAP 2026 - 2030 goals** (policy, production, trade).
- **Reinforcement of Indonesia's role** in the United Nations Global Seaweed Initiative as a founding member.



➤ Product Scope and Methodology

- List of selected products categories using HS codes (which ones and why they are the most relevant/selection criteria)
- Methods: This assessment employed a mixed-method approach combining data analysis, desk research, and stakeholder engagement.
- Desk work involved reviewing relevant policy documents, reports, and statistical data to establish the current state of Indonesia's seaweed sector.
- Consultations and semi-structured interviews were conducted with representatives from government ministries, UN agencies, cooperatives, SMEs, and women and youth groups to capture diverse perspectives and practical insights.
- Field visits to selected production sites to understand supply side and export capacity
- Data Limitations and Assumptions: Available data on seaweed production, trade, and processing are often fragmented across ministries and agencies, with inconsistencies in coverage and classification.
- Assumptions were made to harmonize figures where discrepancies existed, particularly in aligning national statistics with international trade databases

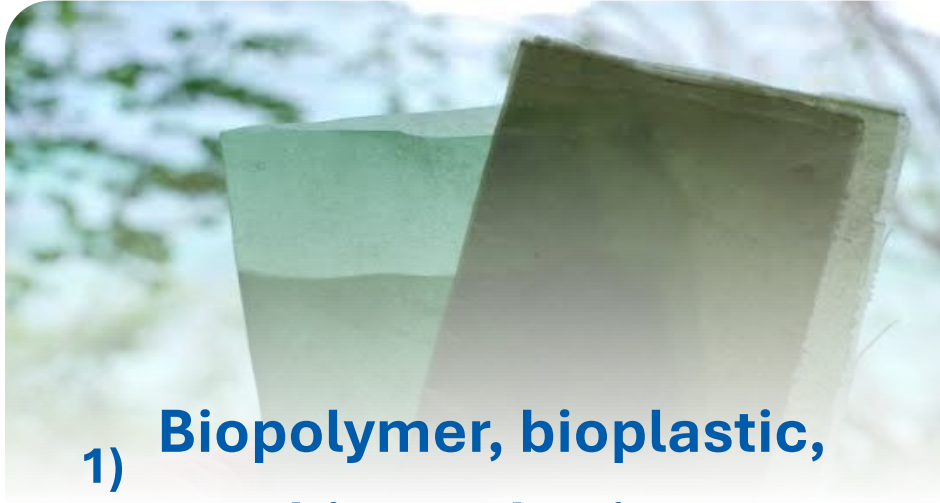
➤ Market and trade prospects in seaweed-based biopolymers, bioplastics, bio-packaging, biostimulants, and fertilizers

Product category	Available Indonesian market evidence	Confidence for seaweed-specific value
Biopolymers	Biopolymer market was estimated at \$2.1 million in 2024, with a forecast of \$7.3 million by 2030. (Grand View Research)	Low: this is only one application segment, includes non-seaweed materials.
Bioplastics	Bioplastic packaging market at \$186 million (2025), forecasting \$412 million by 2032. (Mobility Foresights)	Low: not seaweed-specific; includes other feedstocks.
Biopackaging	Seaweed-packaging market report exists, covering edible packaging, biodegradable films, water-soluble films and seaweed materials, but its numerical estimates are not available in the public summary.	Low until the report's figures can be verified.
Biostimulants	Seaweed-extract biostimulant market was estimated at \$5.17 million in 2024, with a forecast of \$11.51 million by 2032 and a stated CAGR of 12.1%. (Data Bridge Market Research)	Medium: directly relevant to seaweed extracts, but based on a commercial market-research estimate.
Biofertilizers	One market database estimates Indonesia's total biofertilizer market at \$0.16 million in 2025, rising to \$0.32 million in 2030. (Wantstats)	Low: broad biofertilizers, not seaweed-specific.



➤ National Development Policies, Strategies and Program

- ▶ **Overview of key aspects of relevance** under the Integrated Seaweed Development Action Plan (ISDAP) 2026–2030 as well as alignment with UNGSI.
- ▶ UNGSI priorities: 1) governance; 2) Finance; 3) National strategies; 4) production; 5) Trade, regulations and standards.
- ▶ **Check if any references to seaweed value addition** and contribution in Indonesia Nationally Determined Contribution to UNFCCC, National Biodiversity Strategy and Action Plan under the Convention on Biological Diversity (CBD) or Blue Economy Plans and bioeconomy plans, as well as **industrial policies and export and investment strategies.**



1) Biopolymer, bioplastic, bio-packaging

- **Applications:** Comprises biodegradable containers, edible packaging, and compostable films/coatings.
- **Key Species:** Produced from non-food seaweed and waste (*Kappaphycus*, *Eucheuma*, *Gracilaria*).
- **Market Drivers:** Demand for sustainable, biodegradable and compostable non-plastic substitutes and bio-packaging, potential UN treaty negotiations on plastic pollution
- **Constraints:** Hampered by limited processing capacity, high R&D costs, and undefined standards.



2) Biostimulant and fertilizer

- **Applications:** Comprises organic fertilizers, soil conditioners, and plant growth boosters.
- **Key Species:** Derived from liquid and powdered seaweed extracts (*Sargassum* and *Ulva* species).
- **Market Drivers:** Growth in organic and regenerative agriculture
- **Constraints:** Hampered by complex EU/US approval processes, low farmer awareness, and competition.

➤ Pre-identified Bottleneck and Enabler

Bottlenecks	Enablers
Fragmented policy and institutional mandates	Strong production base and Blue Economy strategy
Limited domestic processing and certification capacity	Rising global demand for sustainable products
High compliance and transport costs and trade barriers	Global and Regional cooperation potential through UNGSI and ASEAN
Gender inequality and limited SME access to finance	Women/youth cooperatives and inclusive innovation

➤ Challenges and opportunities for trade

Challenges

- **Tariff and non-Tariff barriers:** complex certification, fragmented standards, documentation requirements.
- **Market concentration and dependency:** dependence on raw exports to China; limited diversification.
- **International competitors / low technology uptake**
- **Lack of Trade and quality infrastructure:** absence of national testing labs for bioplastics and fertilizers.

Opportunities

- **Domestic market potential for by-products from these two value chains**
- **Established major export destinations for Indonesia,** to be identified by trade value and their market access stringency.
- **Potential export destinations for Indonesia,** to be identified by trade value and their market access stringency.
- **Estimation of trade potential that can be realized,** based on the above international demand and the production capacity of Indonesia.



International regulations, standards & Certification

Biopolymers & bio-packaging	ISO 17088, EN 13432, ASTM D6400, USDA BioPreferred, TÜV Austria “OK Compost”
Biostimulants & fertilizers	EU Fertilising Products Regulation 2019/1009, Codex Alimentarius, US EPA/USDA registration, Organic (EU/US/JAS)
Cross-cutting	ASC/MSC Seaweed Standard, Global G.A.P. Traceability. EU Corporate Sustainability Due Diligence Directive
Emerging requirements	EU Digital Product Passport, blockchain-based traceability
Other barriers	High certification costs, fragmented ASEAN standards, limited domestic testing capacity





Environmental, Social, and Gender Consideration

Environmental



- **Current Status:** Supports coastal ecosystems through rapid seaweed growth and natural carbon absorption.
- **Scale-Up Impact:** Accelerates the transition toward circular bioeconomy models and global plastic waste reduction.

Social



- **Current Status:** Directly sustains **62,000 farming households** and tens of thousands more in casual labor and trade.
- **Scale-Up Impact:** Enhances regional cash income, strengthens food security, and boosts community-based cooperatives.

GESI



- **Current Status:** Engages men in sea-based farming while women dominate post-harvest and household processing.
- **Scale-Up Impact:** Opens new leadership and economic opportunities for women and youth in advanced biorefineries.

➤ Institutional & Coordination Gaps

1. National Ministries

- **Overlapping mandates** among Marine Affairs, Industry, Trade, Agriculture, Environment, and Women Empowerment.
- **Lack of unified national framework** for seaweed-based biopolymers, bioplastics, bio-packing, bio stimulants and fertilizers.
- **Weak integration** of production, trade, and gender data.

2. UN Agencies

- **Parallel initiatives** by UNCTAD, FAO, UNIDO, UN Women, UNEP, and UNRCO.(increased coordination after UN 80)
- **Limited joint programming and alignment** with national priorities.

➤ Coordination Options

National Level

- 1 Seaweed Value Chain Task Force, chaired by MMAF & Industry
- 2 Implement the Integrated Seaweed Development Action Plan (ISDAP) 2026–2030, linking upstream and downstream
- 3 National Certification & Standards Center for bioplastics and fertilizers

UN System Level

- 1 UNGSI as global platform on seaweed coordination for food and non food uses
- 2 Further align UN support with Indonesia's Blue Economy strategy
- 3 Jointly develop capacity-building programmes for SMEs, women and youth

Cross-Cutting Mechanisms

- 1 Shared data platform integrating production, trade & gender metrics
- 2 Public–private partnerships for certification and innovation
- 3 Pilot inclusive certification labs and digital traceability systems



Strategic Recommendations

- 1 Strengthen R&D, technology upgrade & processing capacity** for biopolymers and biostimulants
- 2 Develop national standards & certification** aligned with export market frameworks
- 3 Promote inclusive financing, training & opportunities** for women, youth and MSMEs
- 4 Encourage public–private partnerships** for technology transfer & commercialization
- 5 Enhance UN coordination** through joint programming & shared data systems



➤ Expected Outcomes

1 Policy coherence
across ministries

2 Streamlined
certification &
export processes

3 Increased
participation of
women & MSMEs

4 Enhanced UN
coordination &
technical assistance

5 Regional
leadership in eco-
certified seaweed
products

6 Recommendations on
improving HS-8/10
granularity for by-
products

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