



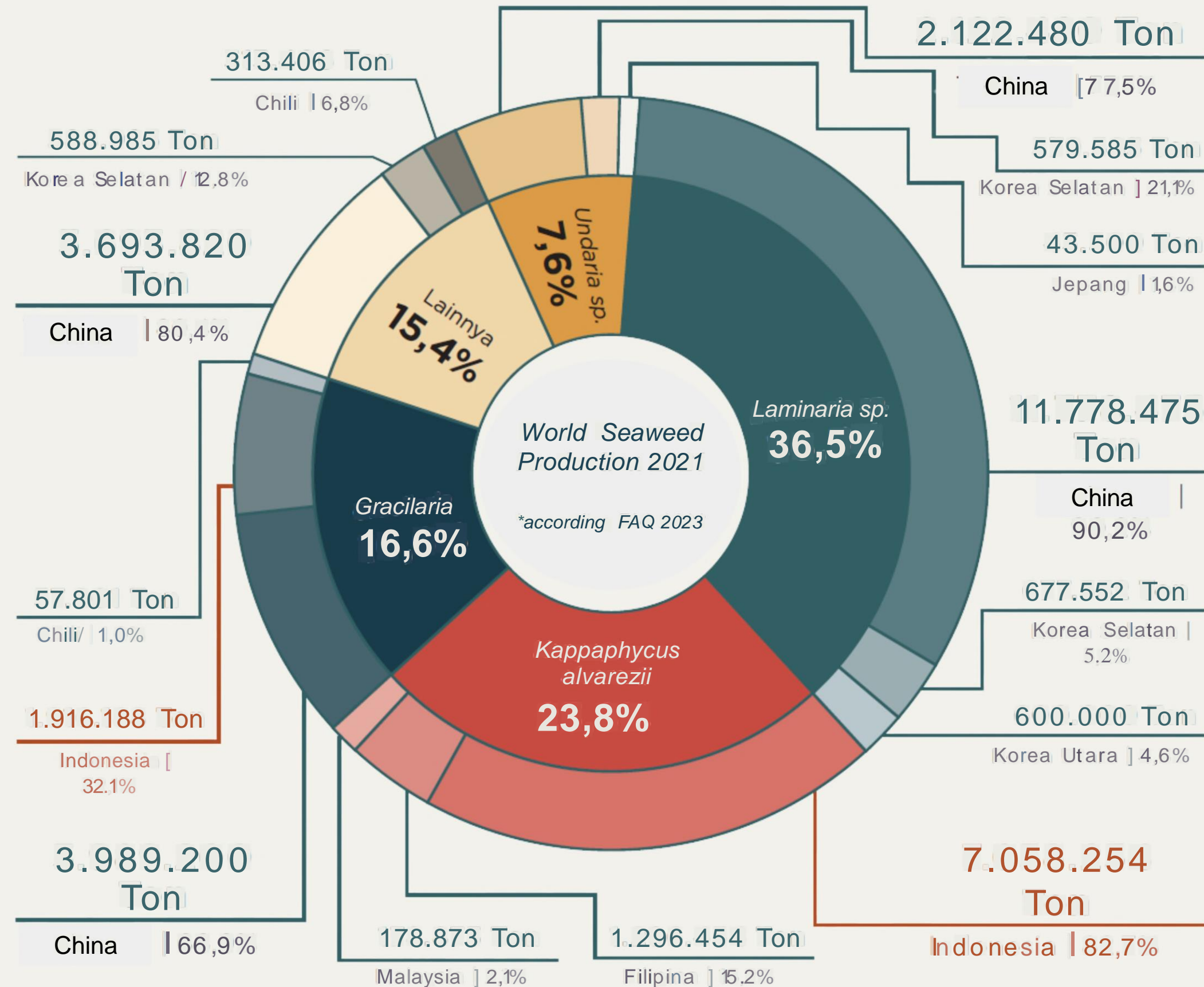
SEAWEED MARKET GLOBAL

22 APRIL 2025

Dr. Maya Puspita (Trading Company: PT Poseidon Algae Nusantara)
Fauziah Hanum (Trading Company: PT Bahari Agro Indonesia)
Ahmad Baikuni (Processing Company: Rumah Lumput Laut)



Global Seaweed Production in 2021



Seaweed Market Global



The demand for seaweed continues to grow, with an average annual growth rate of 10.4%. In 2022, it was recorded at USD 3.71 billion.



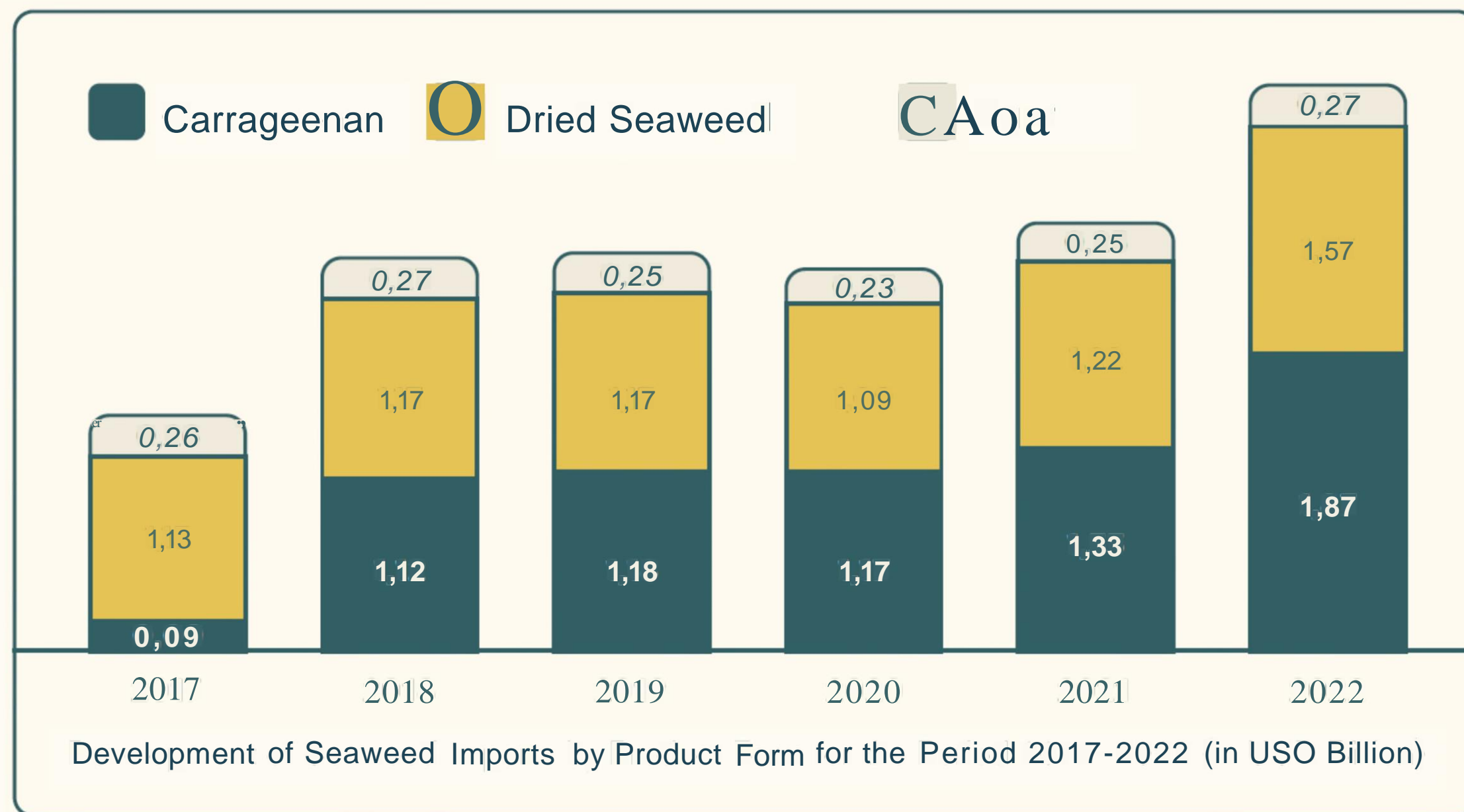
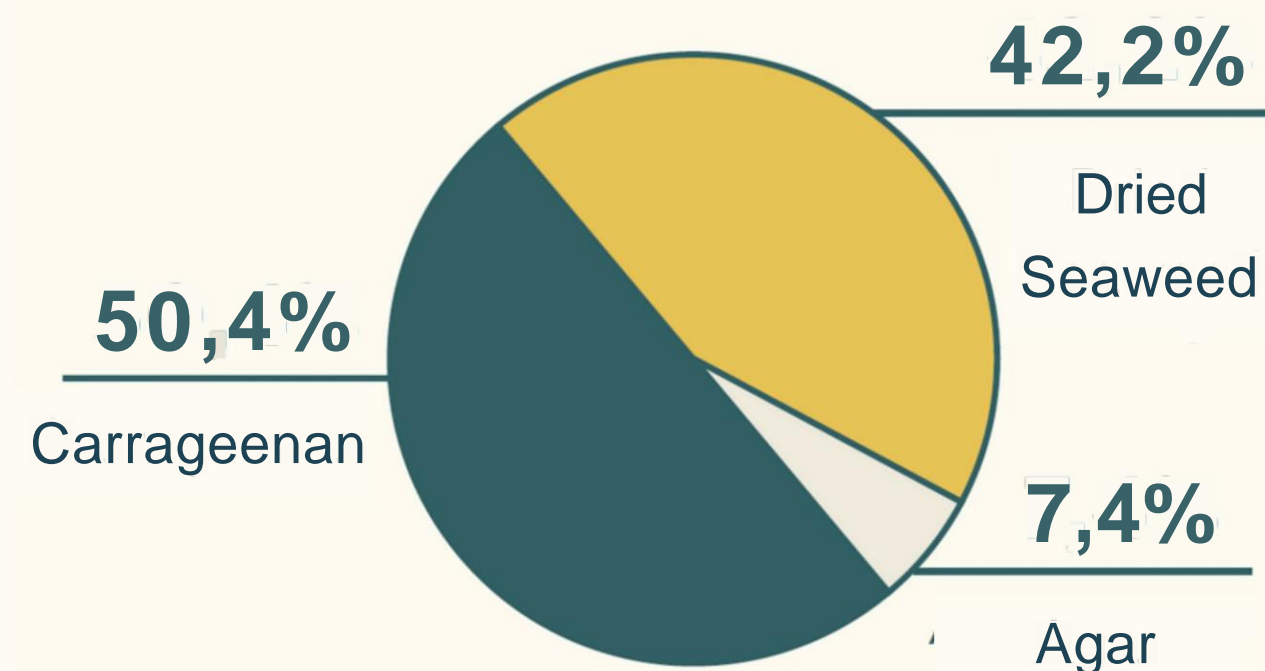
World's Largest Seaweed Importers and Their Import Values (2022)



| Country | Share | Trend (YoY) | Share IDN |
|-----------------|-------|-------------|-----------|
| Tiongkok | 21,6% | 62,9% | 54,0% |
| Uni Eropa | 15,6% | 39,6% | 8,6% |
| Amerika Serikat | 9,5% | 37,6% | 7,5% |
| Jepang | 8,0% | 13,2% | 3,9% |
| Rusia | 4,6% | 32,4% | 4,2% |

Tiongkok (China) is the largest importer, with a value of USO 0.80 billion, accounting for 21.6% of total global seaweed imports.

Total Global Seaweed Imports in 2022 by Product Form



BAI's Export Destination Countries



China
(HACCP, GACC)



India
(HACCP, No Register India)



Vietnam
(HACCP)



Moroco
(HACCP)



Tunisia
(HACCP)

BAI's Production Capacity Per Month



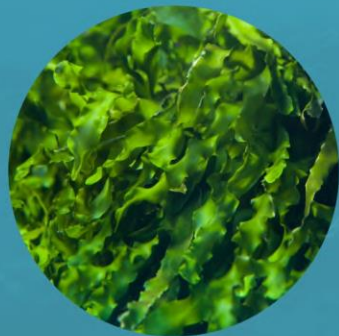
Chop Sargassum
200 Ton



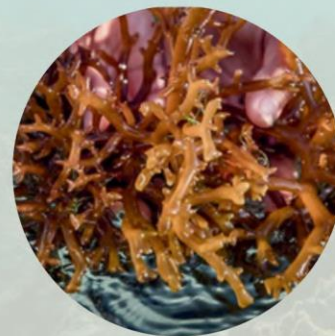
Raw Sargassum
300 Ton



Spinosum
300 Ton



Ulva Lactuca
200 Ton



Cottonii
350 Ton



Gracilaria
450 Ton

Starting Export



Exhibition / Trade Show

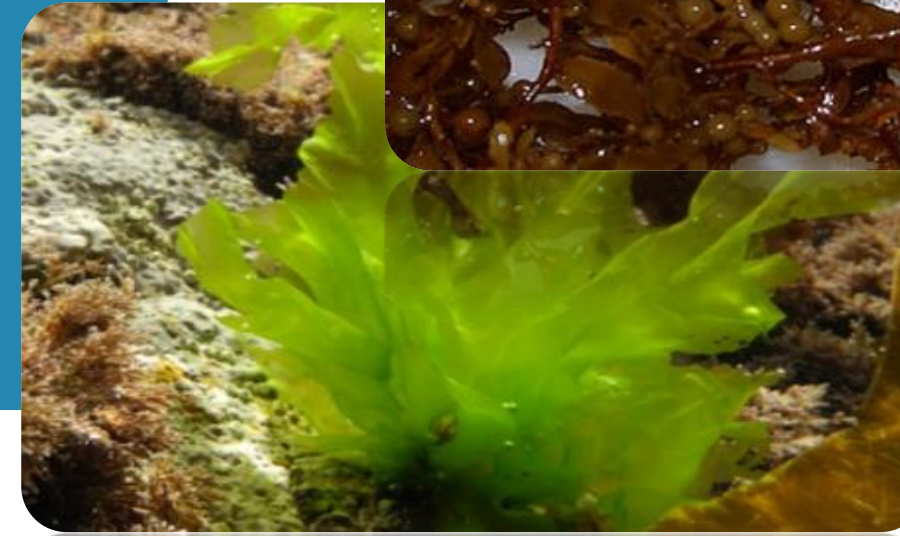
JISTE (Japan International Seafood Trade Expo 2024)
Tokyo Big Sight



SIAL Interfood Seafood Expo JIEXPO 2024



approach of seaweed product development, chemical composition, and potential application in industry



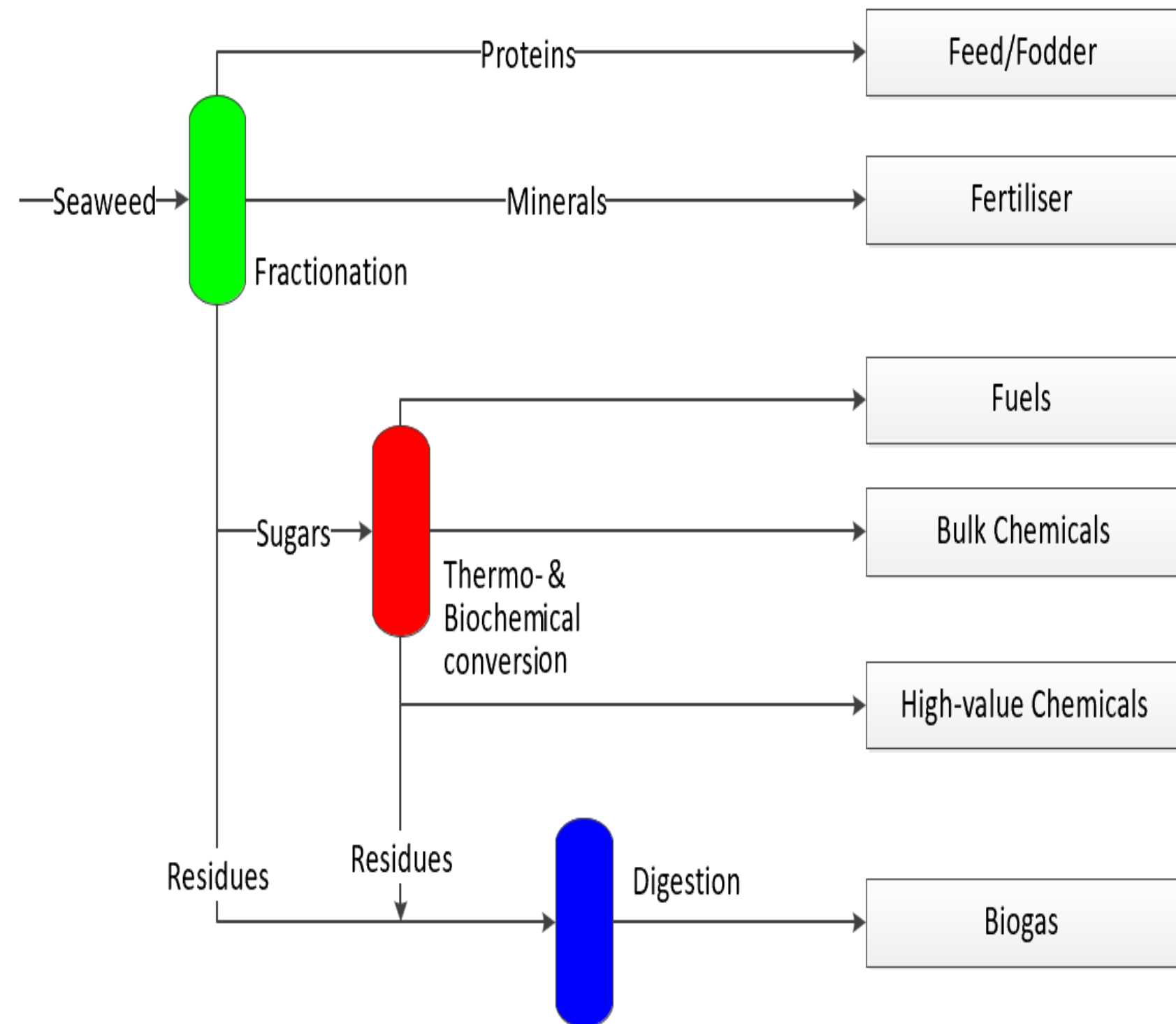
- Seaweed generally produces primary metabolites in the form of **carrageenan**, **agar-agar**, and **alginate** (hydrocolloids), commonly used as raw materials for pharmaceuticals, food, and textiles.
 - Seaweed also produces bioactive compounds such as phenolic compounds, flavonoids, steroids, saponins, alkaloids, polyphenols, and phlorotannins which
- ### **Ecosustainable Source of Cosmetic Ingredients**
- Contribute to **emission reductions** (Blue Carbon)

Seaweed biorefinery



SEAWEED

- **Cosmetic, Farmacy and health**
 - Antimicrobial, Antifungal, Antiviral, Anti-inflammatory, Anti-coagulant, Anti-carcinogenic.
- **Functional foods**
 - Vitamin A,B,C,D,E,K, Amino acid, Mineral, Proteins
- **Bio stimulant dan Feed additive**
 - Plant nutrients and Fish feed
- **Food, Feed, and Fertilizer**
 - Nori, Spaghetti, Burger, Mie, POH,
- **Bioplastics and Biomaterials**
 - Plastics, Bioimplant,
- **Biofuel**
 - Bio crude oil



SEAWEED POTENTIAL APPLICATION IN INDUSTRY

Ecosystem services



Bioindicator for ocean health



Bio-filtration for nutrient and pollution



Improve **water quality**



Natural feed for biota



Oxygen production



Carbon absorption

Cosmeceutical



Phycoerythrin



Face serum



Soap



Body scrub

Nutraceutical, Pharmaceutical



Analog seaweed rice



Oligosaccharide



Seaweed ginger



Seaweed eggroll

Bio-stimulants, Food and Feed additive



Bio stimulant



Fertilizer



Fish feed



Biofertilizer

Biomaterial and Biofuel



Bioplastic



Bioethanol



Bioimplants





Seaweed Hand & Body Lotion



Products Produced



Seaweed Peel Off Mask



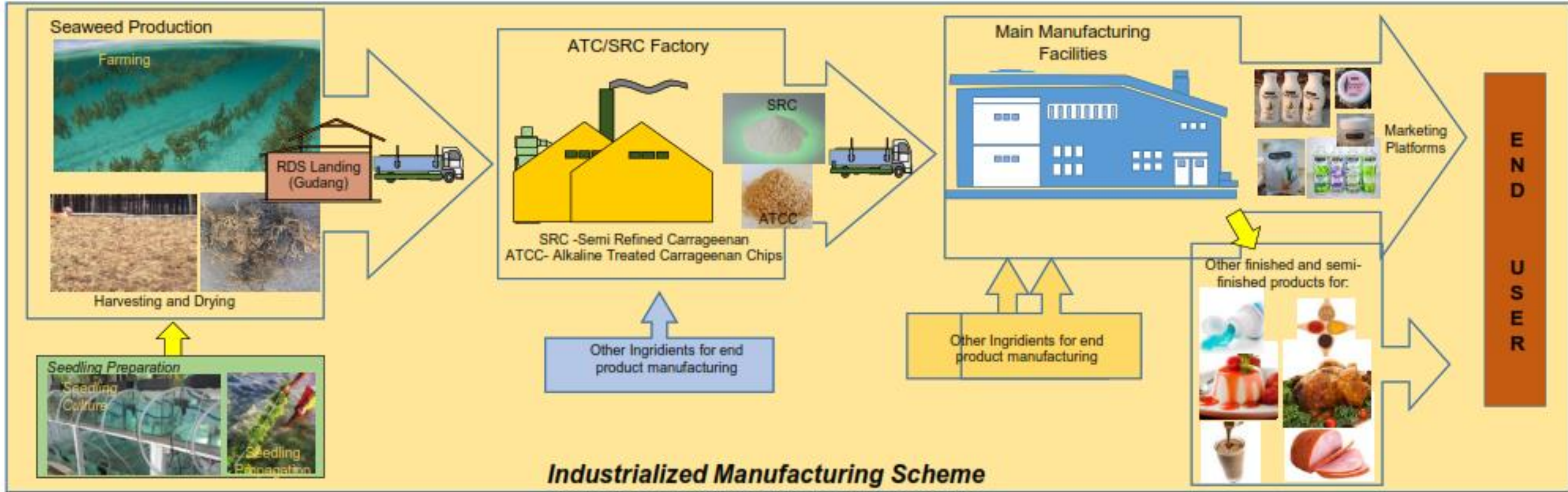


Seaweed Face Cream

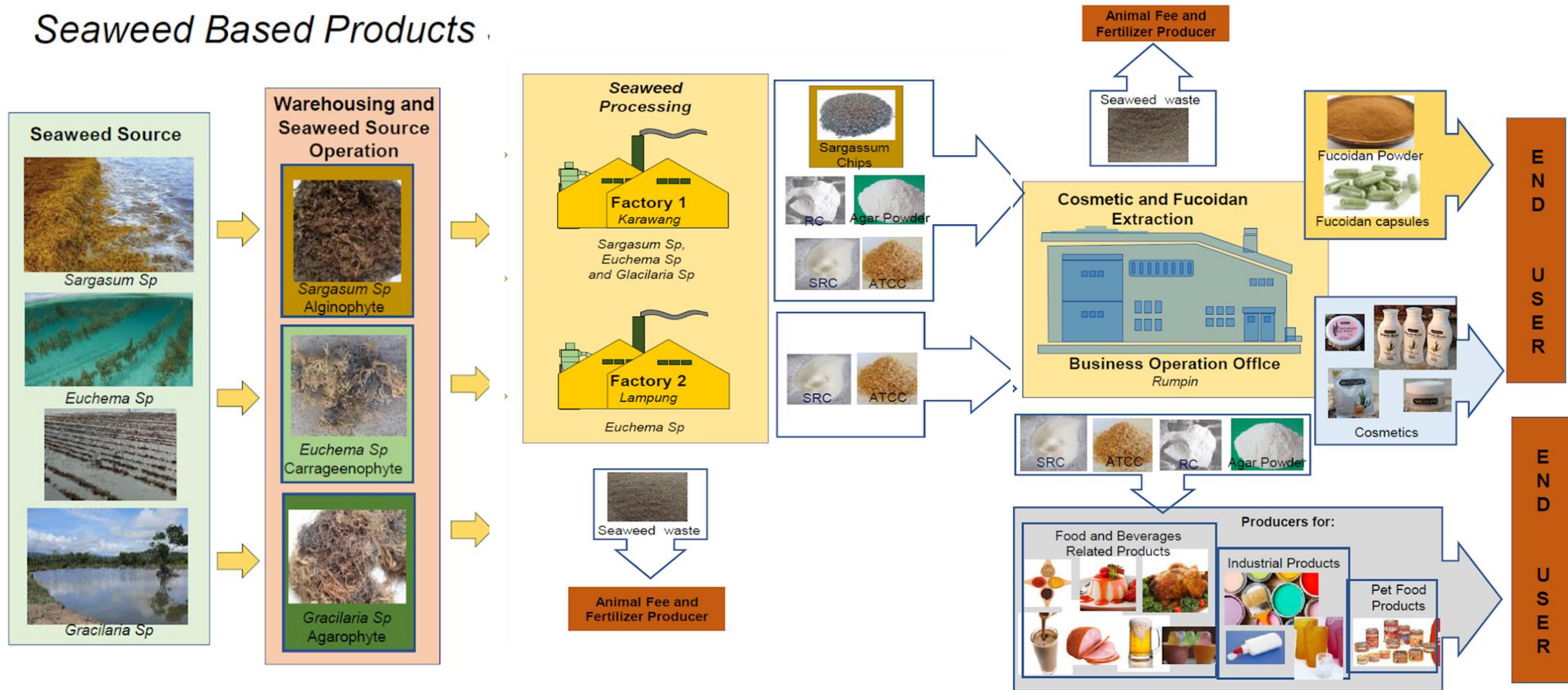
Seaweed Lip Balm



Seaweed Based Products Supply Chain



Seaweed Based Products



Overview on Seaweed Industry in Indonesia and the Development Potential of Bangladesh



Commercially cultivated biomass in Indonesia



Gracilaria sp



Eucheuma denticulatum



K. alvarezii varian Tambalang green



K. alvarezii varian Tambalang brown



K. Striatum (sakol)

Natural stock biomass



Gelidium sp.



Sargassum sp.

Caulerpa sp.

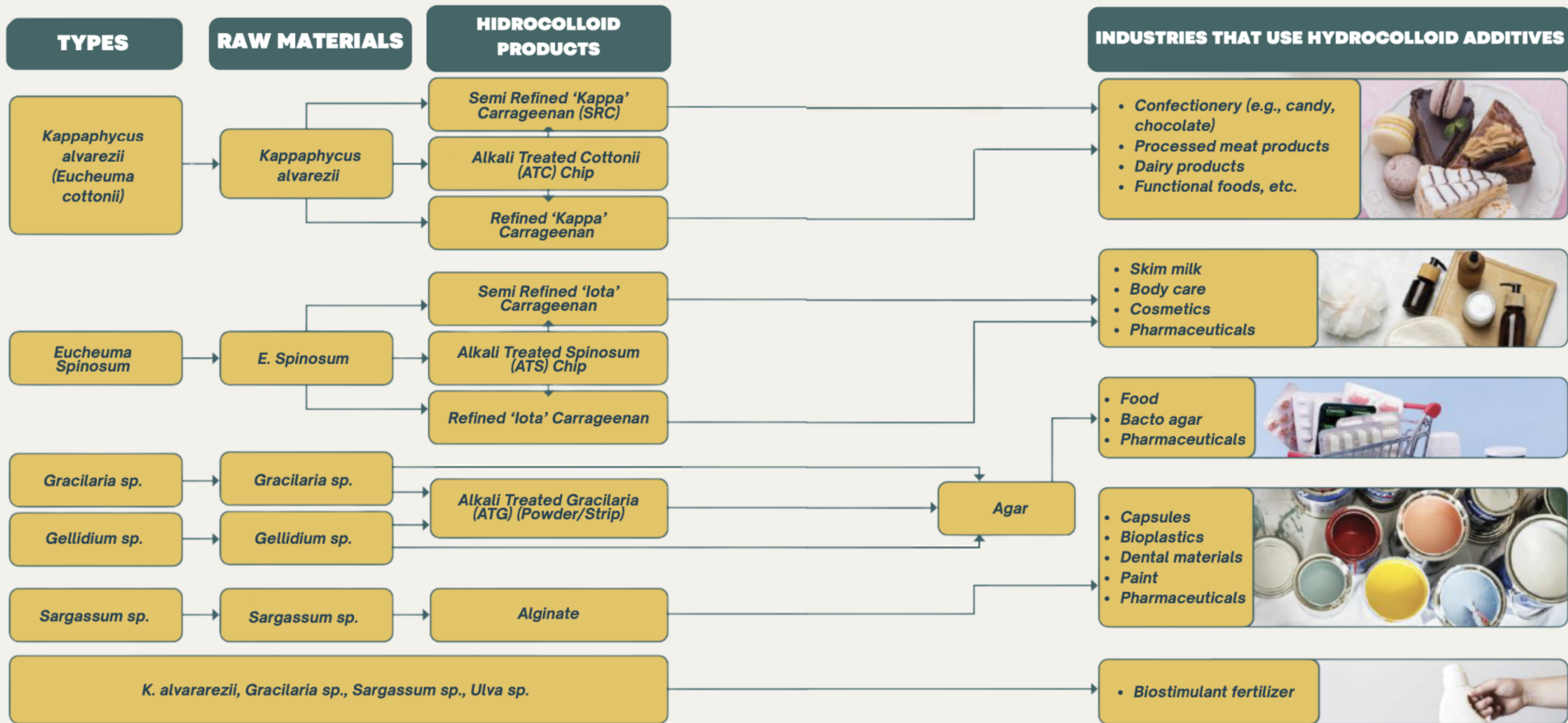


Ulva sp.

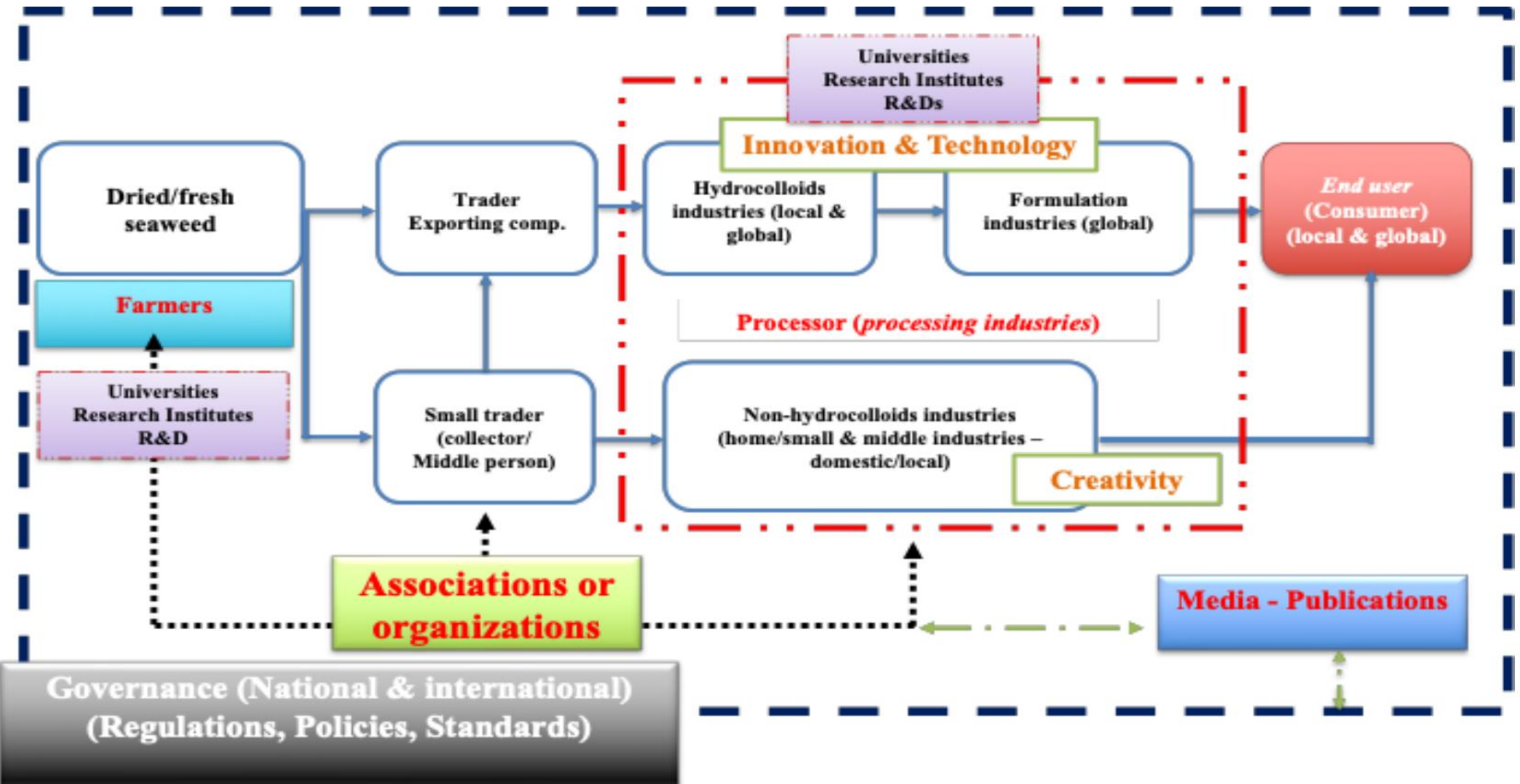
Codium sp.

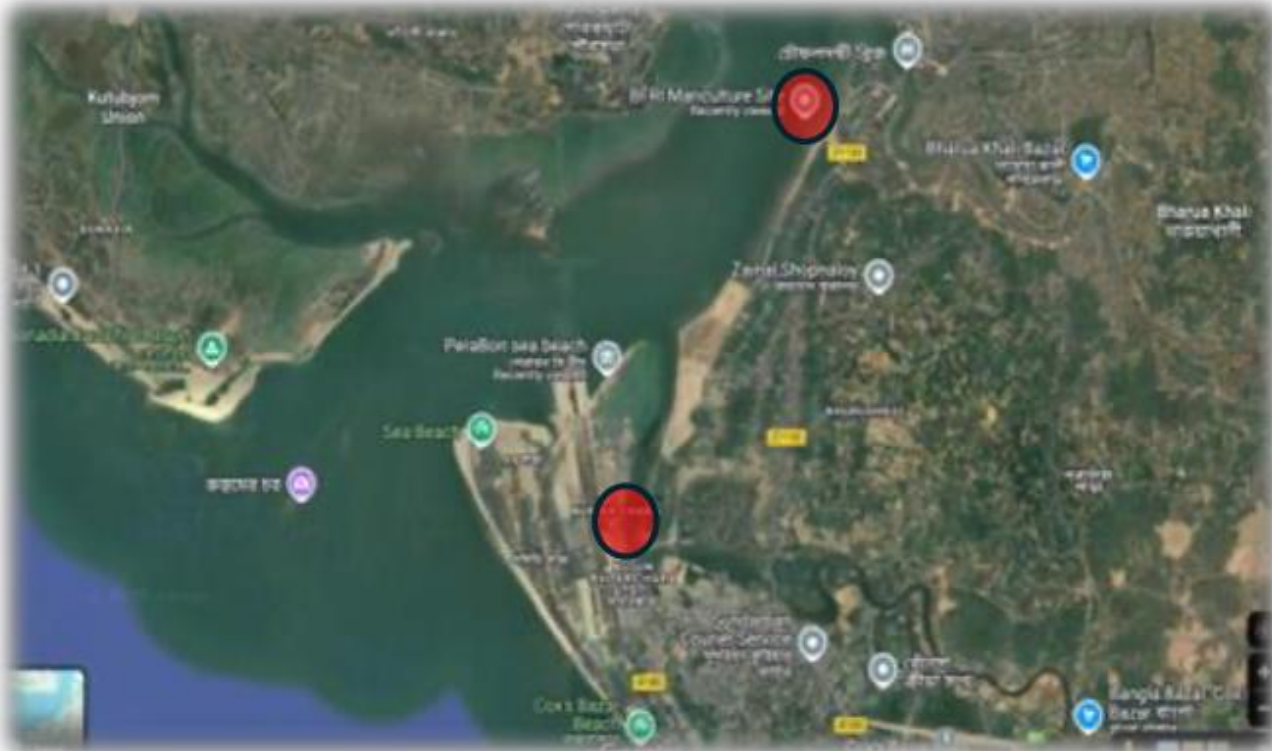


Seaweed and Its Derivative Products



Stakeholders Chain – Determine the role of each stakeholder





BARI – Bangladesh Agriculture Research Institute



BFRI – Bangladesh Fishery Research Institute

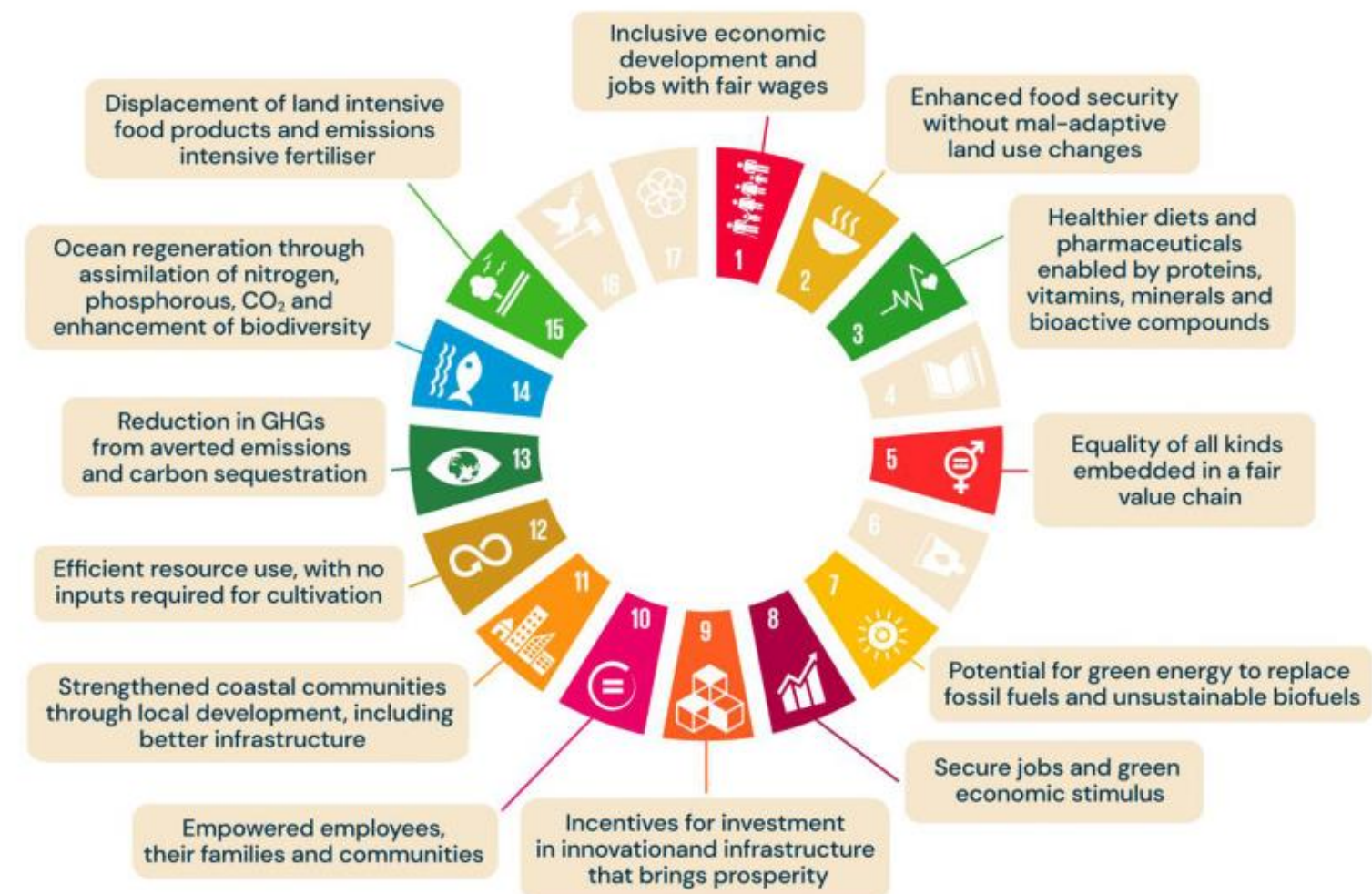




Seaweed must be considered as national strategic commodity contributing significantly to the society, economy and environment and aligning to the SDGs achievement

- Nunier Chara community obtains 30.000 USD from 5 months cycle of seaweed harvest from 30 tons production
- There are 20 families involved, so the monthly revenue of 1 family from seaweed (*Gracilaria*) farming is 250 USD (equal with 30.000 BDD)
- Around 90% of the farmers are women in Bangladesh
- *In Indonesia, ratio of women involved in seaweed farming is 30%, estimated 20% becomes trader and seaweed is our strategic commodity to alleviate poverty of marginalized people of coastal and islands people*

A thriving and sustainable seaweed industry results in...



- Biodiversity of seaweed species
- Existence of wild crops
- Long coastline
- Human resources
- Knowledge on farming and post-harvest treatment
- Research institutes
- Women enthusiasms

Strength

- 6 seasons with only 6 months for farming
- Development focus on seaweed sectors
- A synergy between research institute

Weakness

Opportunity

- Global market demand is growing
- Global awareness on health and organic product
- Potential researches' results to develop
- Presence of innovative products from small-medium enterprises

Threats

- Absence of Good Aquaculture practice standard another seaweed standards
- Non-competitive raw material for global market due to high price

Recommendation for Bangladesh concerning Seaweed Business Development

Market Research and Analysis

Product Diversification

Infrastructure Development

Branding and Marketing

Training and Education

Policy Support and Incentives

Sustainability Practices

Participation in Trade Shows

Partnerships and Collaborations

Research and Development

Yearly basis plan that can be performed

First Phase: 1 until 2 years

Improve production for commercial scale for *Ulva* and *Gracilaria*

Seed nursery ground development for seed stocks

Local trading for small-medium enterprises for raw material and innovative seaweed-based products

Target: Produce 1-2 ha of *K. alvarezii* (cottonii) nursery ground (estimated seed production up to 60 T)



Target: Develop +/- 10 ha (= 4.000 lines) of *K. alvarezii* (cottonii) for biomass production up to 80 T dry weight

Timeline

Second Phase: 2 until 3 years

Global market penetration for dried seaweed or semi-processed or end-products (trading for export process)

Encourage collaboration and partnership with private sectors for added-value products based on research results

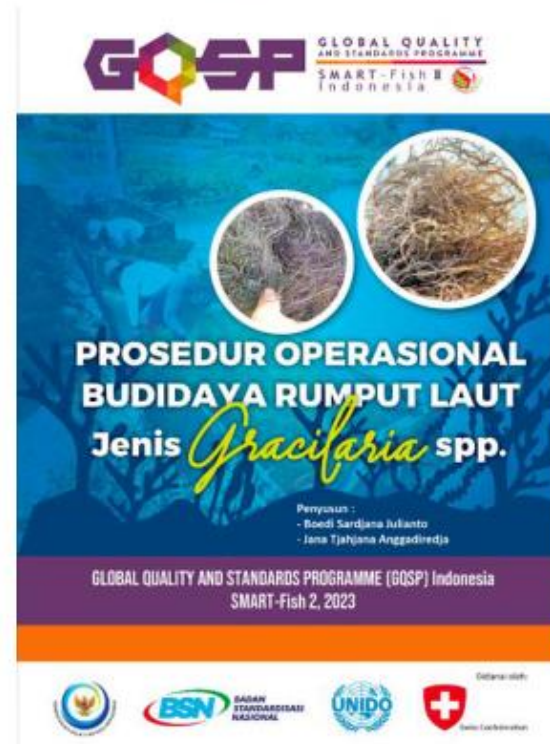
Third Phase: 4 years onward

Processing of seaweed biomass with high quantity such as carrageenan or agar-agar

Diversification of seaweed species production

Diversification of products – probably with high end

FIGURE 6. Sustainable Aquaculture Supply Chains



First Phase

- Government of Bangladesh through research institutes and agency, example: BARI, BORI, BFRI , Bangladesh Standard Agency (*in collaboration with private sectors, universities*):
- Training of Good Aquaculture Practice (GAP) to Farmers for sustainable practices
 - GAP standard covers farming methode, location, seed selection and seedling process, harvest, post-harvest (cleaning, sorting, drying and packaging)
- Establishing Standards in accordance with market requirements
- Universities and Private Sectors involve in providing academic and practical experience related to seaweed farming to community especially for updates on technology or method

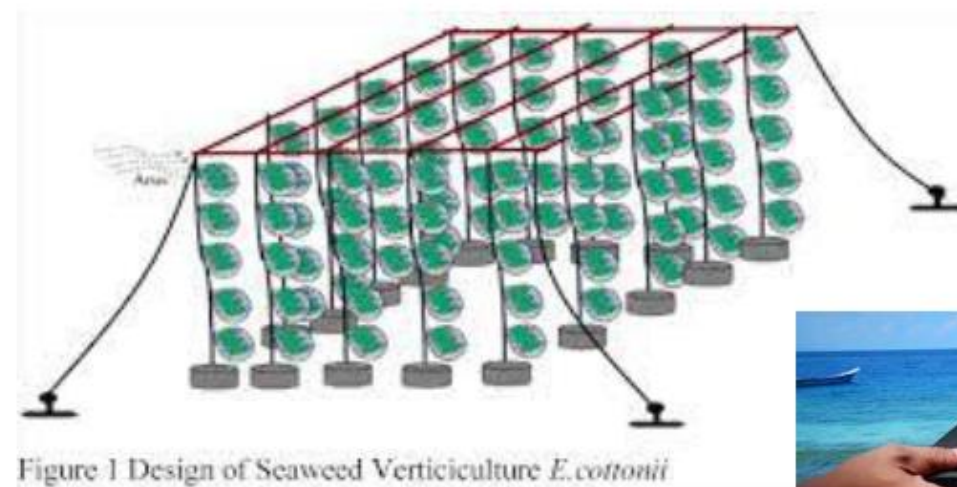


Figure 1 Design of Seaweed Verticiculture *E.cottonii*



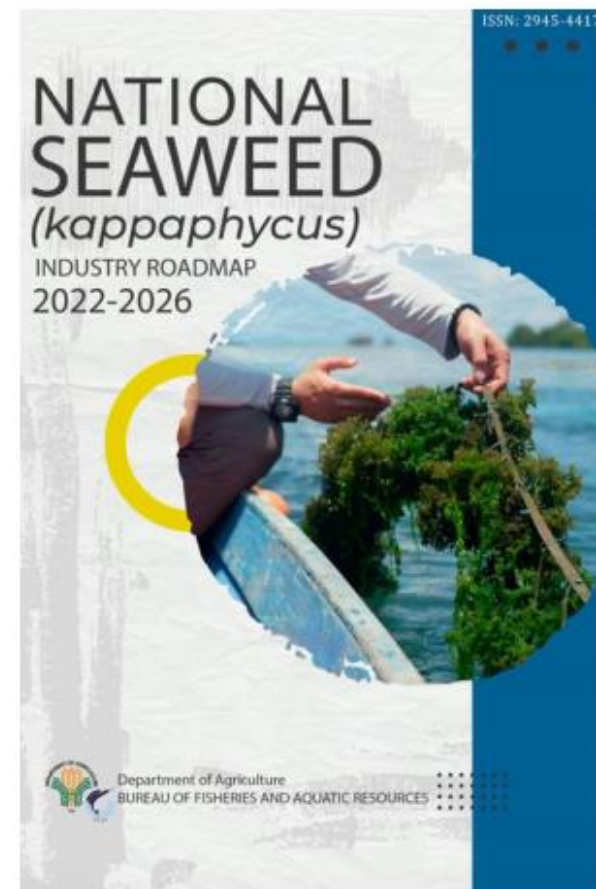
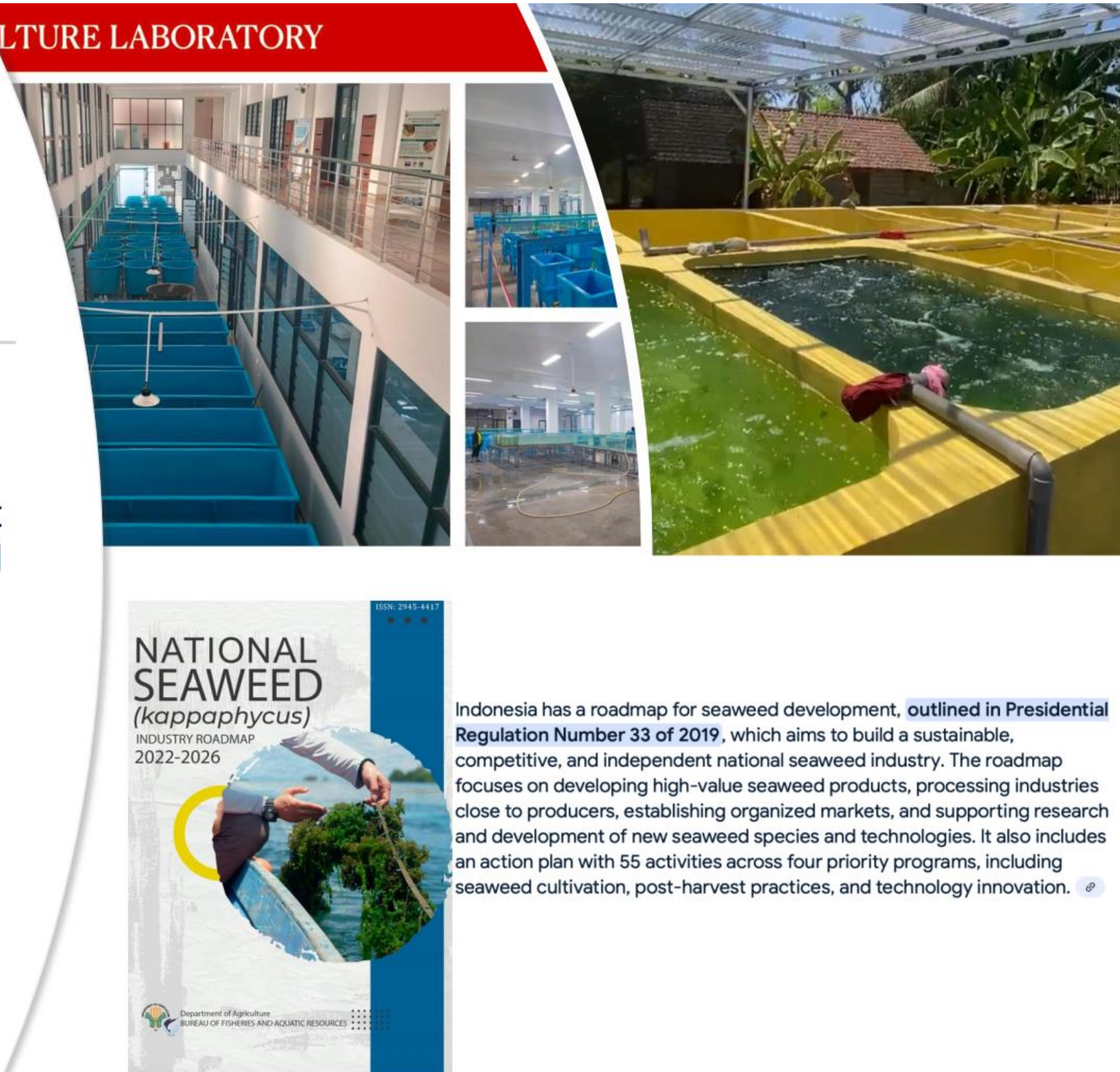
First Phase (continued)

Government:

- Support in establishing infrastructure
- Facilitate on business and/or product certification for both domestic and export purposes

Within this time frame, the government must already have:

1. National Road Map on Seaweed Development (identify the species and the application, target of production, ...)
2. Policies and regulation on seaweed farming, processing, export etc..



Indonesia has a roadmap for seaweed development, outlined in Presidential Regulation Number 33 of 2019, which aims to build a sustainable, competitive, and independent national seaweed industry. The roadmap focuses on developing high-value seaweed products, processing industries close to producers, establishing organized markets, and supporting research and development of new seaweed species and technologies. It also includes an action plan with 55 activities across four priority programs, including seaweed cultivation, post-harvest practices, and technology innovation.

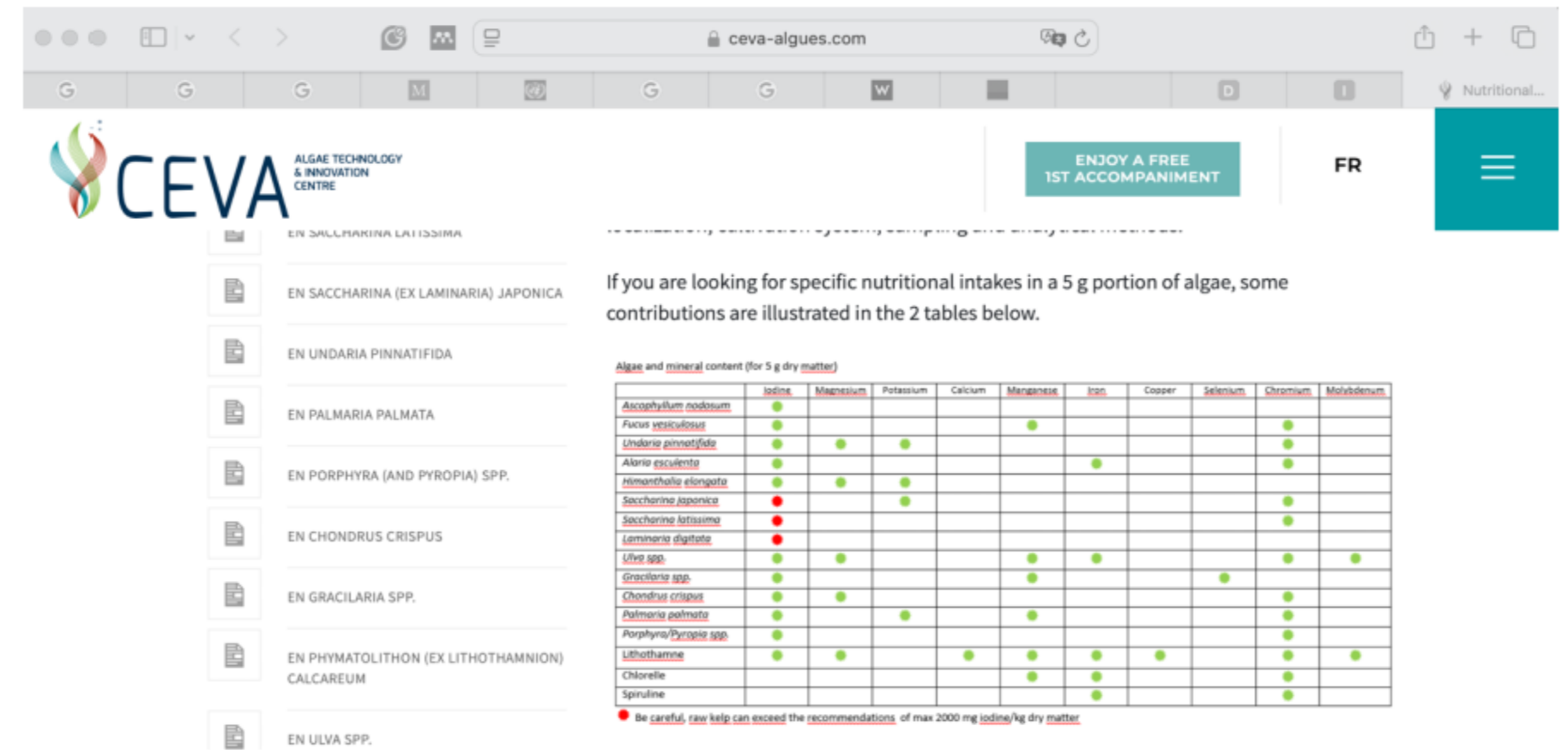


Second Phase

- Private sectors involvement with Government support especially Ministry of Trade, Trade Attache and Embassy and associations
 - Government facilitate small-medium enterprises to participate in Trade Expo or other exposition as well as business matching
 - Government facilitate training program about seaweed export, branding, marketing in collaboration with private sectors and/or universities

Third Phase

- Research and development of Private Sector with the support from research institutes and universities with research collaboration for innovation products and technology
- Encourage the development of factory in accordance with local demand based on market research and feasibility study → Universities and Private Sectors



CEVA ALGAE TECHNOLOGY & INNOVATION CENTRE

ENJAY A FREE 1ST ACCOMPANIMENT

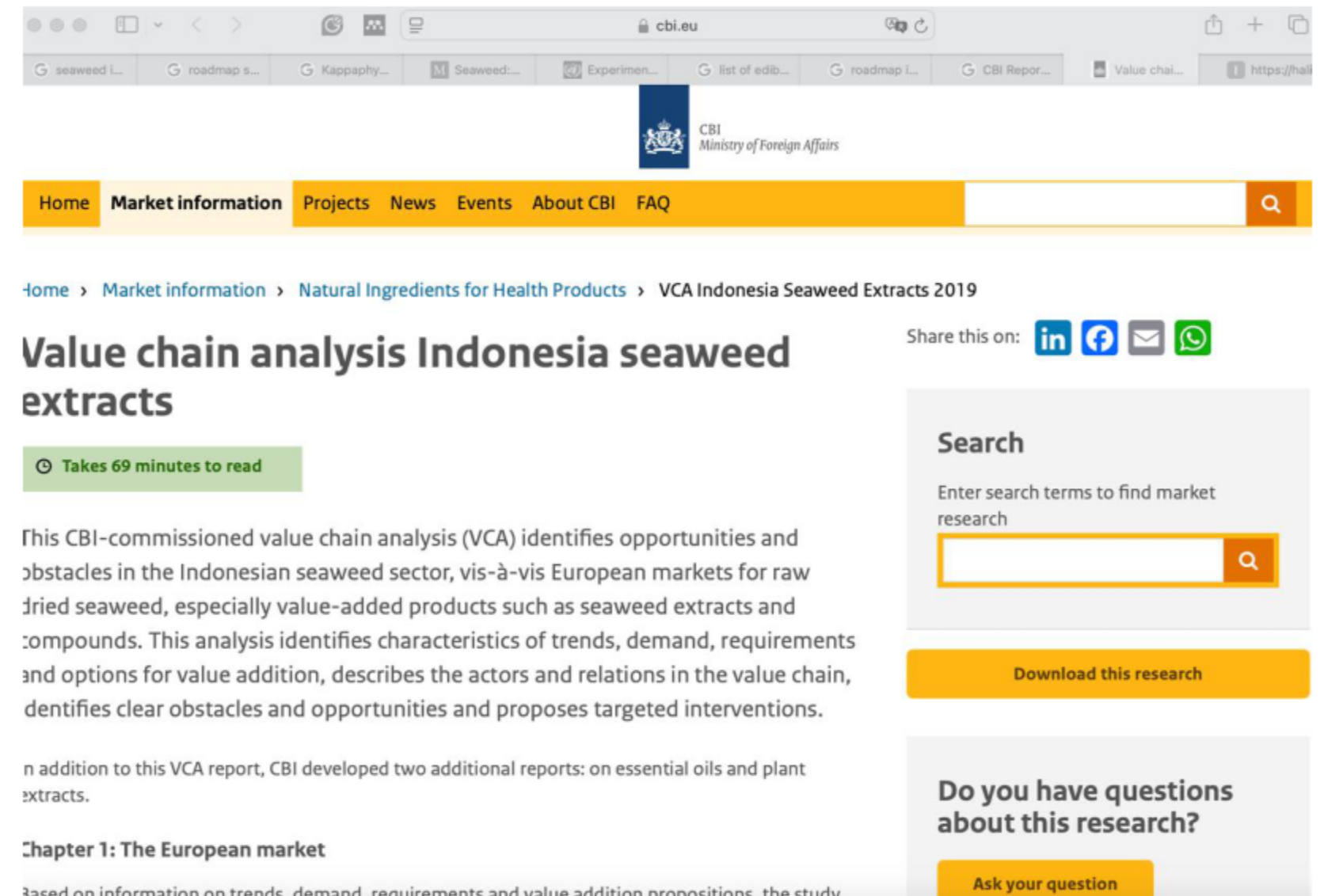
FR

If you are looking for specific nutritional intakes in a 5 g portion of algae, some contributions are illustrated in the 2 tables below.

Algae and mineral content (for 5 g dry matter)

| | Iodine | Magnesium | Potassium | Calcium | Manganese | Iron | Copper | Selenium | Chromium | Molybdenum |
|-------------------------------|--------|-----------|-----------|---------|-----------|------|--------|----------|----------|------------|
| <i>Ascophyllum nodosum</i> | ● | | | | ● | | | | ● | |
| <i>Fucus vesiculosus</i> | ● | | | | ● | | | | ● | |
| <i>Undaria pinnatifida</i> | ● | ● | ● | | | | | | ● | |
| <i>Alaria esculenta</i> | ● | | | | | ● | | | ● | |
| <i>Himanthalia elongata</i> | ● | ● | ● | | | | | | ● | |
| <i>Saccharina japonica</i> | ● | | ● | | | | | | ● | |
| <i>Saccharina latissima</i> | ● | | | | | | | | ● | |
| <i>Laminaria digitata</i> | ● | | | | | | | | ● | |
| <i>Ulva</i> spp. | ● | ● | | | ● | ● | | | ● | ● |
| <i>Gracilaria</i> spp. | ● | | | | ● | | | ● | ● | |
| <i>Chondrus crispus</i> | ● | ● | | | | | | | ● | |
| <i>Palmaria palmata</i> | ● | | ● | | ● | | | | ● | |
| <i>Porphyra/Pyrropia</i> spp. | ● | | | | ● | | | | ● | |
| <i>Lithothamnion</i> | ● | ● | | ● | ● | ● | ● | | ● | ● |
| <i>Chlorella</i> | | | | | ● | ● | | | ● | |
| <i>Spirulina</i> | | | | | | ● | | | ● | |

● Be careful, raw kelp can exceed the recommendations of max 2000 mg iodine/kg dry matter



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Value chain analysis Indonesia seaweed extracts

Takes 69 minutes to read

This CBI-commissioned value chain analysis (VCA) identifies opportunities and obstacles in the Indonesian seaweed sector, vis-à-vis European markets for raw dried seaweed, especially value-added products such as seaweed extracts and compounds. This analysis identifies characteristics of trends, demand, requirements and options for value addition, describes the actors and relations in the value chain, identifies clear obstacles and opportunities and proposes targeted interventions.

In addition to this VCA report, CBI developed two additional reports: on essential oils and plant extracts.

Chapter 1: The European market

Based on information on trends, demand, requirements and value addition propositions, the study

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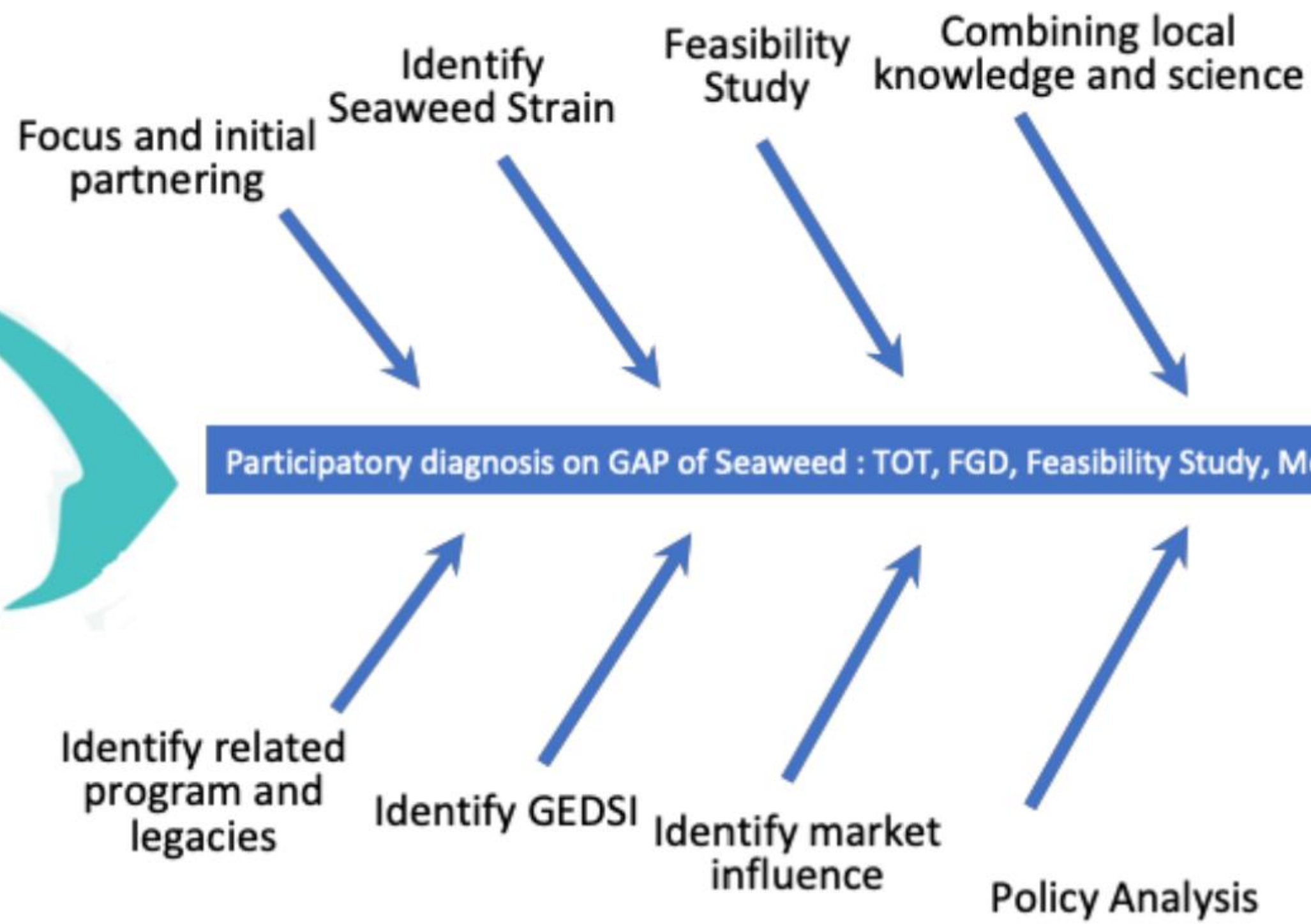
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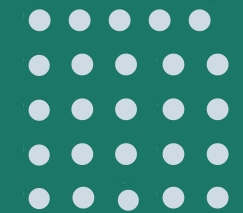
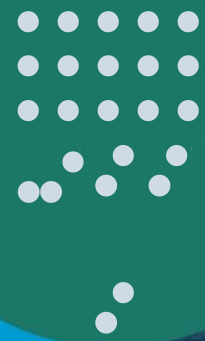
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Governance
Perspective of
Seaweed
Aquaculture



THANK YOU!



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