Seaweed Economics

Nichola J. Dyer
Senior Advisor
Partnerships, Communication & Engagement
Safe Seaweed Coalition
Production and market trends in the emerging seaweed market
Global Seaweed Production

Cultivation accounted for **97%** of world seaweed production in 2019, at 34.7m t
Wild collection 1.1m t in 2019

**Cultivation trends, 1950-2019**

- **World**: 34,700 t Æ 34.7m t
  - **Brown**: 13,000 t Æ 16.4m t
  - **Red**: 21,000 t Æ 18.3m t
  - **Green**: 16,696 t (2019), declining

**Industry value (USD)**

2003: 6b
2019: 11b

(FAO 2021)
Production & Market Trends: Global Production

Status and trends of global seaweed production, 1950 – 2019

Production & Market Trends: Trade

### Exports 2019

<table>
<thead>
<tr>
<th>Seaweeds and seaweed-based hydrocolloids</th>
<th>Exporter</th>
<th>Million USD</th>
<th>Share of world (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. China</td>
<td>578</td>
<td>21.79</td>
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<tr>
<td></td>
<td>2. Indonesia</td>
<td>329</td>
<td>12.39</td>
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<tr>
<td></td>
<td>3. Rep. of Korea</td>
<td>320</td>
<td>12.08</td>
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<td></td>
<td>4. Philippines</td>
<td>252</td>
<td>9.52</td>
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<td></td>
<td>5. Chile</td>
<td>209</td>
<td>7.87</td>
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<td>6. Spain</td>
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<td>7. France</td>
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<td>8. USA</td>
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<tr>
<td></td>
<td>World</td>
<td>2 652</td>
<td>100.00</td>
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Source: FAO (2021)

### Imports 2019

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<tr>
<td></td>
<td>1. China</td>
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<td>2. Japan</td>
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<td>3. United States of America</td>
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<td>9. United Kingdom</td>
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<td>2 899</td>
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</tbody>
</table>

Source: FAO (2021)
Production & Market Trends: Downstream Products

- Human foods
- Hydrocolloids
- Feed
  - Abalone
  - Livestock
  - Fish
- Biofertilizers-biostimulants
- Others:
  - Cosmetics; nutraceuticals; pharmaceuticals
  - Textile fibres; biopackaging
  - Waste treatment
  - Carbon capture/sequestration
  - Bioenergy
  - …

(FAO 2021)
Production & Market Trends

Startups (beyond Asia)

- Most are pre-revenue (research or pilot stage) rather than scale-ups (validation and scale-up stage)
- Europe so far has the most startups, followed by the US and Australia
- Over half of all startups and scale-ups are transforming seaweed biomass into higher-value products

Source: Phyconomy Report 2022

Zone: Europe, Americas and Oceania
Assessing potential for seaweed farming, acquiring know-how and technology
Assessing potential for seaweed farming, acquiring know-how and technology

Geography

• From an international development and poverty alleviation perspective, Panama, Brazil, India and Indonesia seem most suitable
• Identify high-priority zones for seaweed aquaculture by overlaying continental shelves, currents and tidal flow areas

Seaweed type

• Red seaweeds
  • SE Africa, Southern India, Central Indonesia, Panama, Northern Brazil and NW Australia
• Brown seaweeds
  • Southern South America, the NE and NW coasts of North America, NW Europe, Southern Australia and New Zealand.

Location: Close to shore or open seas

• Different skillsets required

World Bank, 2016
Assessing potential for seaweed farming, acquiring know-how and technology

- National development planning
  - Marine Spatial Planning
  - NDCs
  - NAPs
- Building/strengthening capacity
  - Stakeholder Consultations
  - Partnerships
- Knowledge
  - Research
  - Knowhow
- Finance
  - Public
  - Private
Identifying trade opportunities and financing initial investments in the seaweed industry
Identifying trade opportunities, financing initial investments

Comprehensive approach

• Implement better protection and restoration of existing seaweed forests through **Marine Spatial Planning** (e.g. through Marine Protected Areas, laws on agricultural run-off from land that impedes seaweed growth, trawling through seaweed sites, etc.)

• **Create an enabling regulatory environment** to obtain licenses to operate and identify and allocate highly productive areas for seaweed cultivation in Marine Spatial Planning nearshore

• **Increase investment** and streamline regulations including for downstream seaweed-based products
  • Increase public investment into seaweed related research, particularly on its interaction with ocean ecosystems
Identifying trade opportunities, financing initial investments

- Monitor possible ecosystem effects in the ocean
  - Science-based risk assessment
- Public communication to build social acceptance, particularly among coastal communities
- International cooperation
  - Majority of cultivation experience is in Asia, while most initiatives to use seaweed for climate mitigation are in the Global North
- Accreditation of seaweed as a climate solution and source of blue carbon
- Improve regulation and governance
  - Reduce threats and better protect natural seaweed forests
  - Streamline regulation and permitting to facilitate a network of nearshore farms
  - Facilitate field trials to determine the full range of impacts of seaweed carbon sinking storage in the deep ocean
  - Agree on global policies and investment to support innovation for offshore cultivation

UNGC / Ocean Stewardship Council (2021)
Identifying trade opportunities, financing initial investments

- Designate specific public sector institutions for oversight and support
- Measure seaweed production and trade explicitly in system of national accounts
Key entry factors and barriers in developing seaweed value chains in developing countries
Key Entry Factors / Barriers to Entry

- **Highly differentiated market** – East Asia / rest of world
- **Fragmentation / lack of cooperation and coordination**
- **Lack of harmonized standards**
  - Concerns about safety – operational, environmental, consumer
- **Demand & supply side**
  - Lack of demand outside of established markets for Asian production
    - Lack of product knowledge
    - Cost structure for new entrants – scale of production
- **Opportunity** for developing countries to produce and capture value-added through processing
  - Women’s involvement & economic empowerment
Conclusions & Recommendations
Conclusions

• Seaweed offers many **sustainability solutions**
  • Tackling ocean warming and acidification, preserving & restoring marine ecosystems
  • Sequestering carbon, potentially reducing methane emissions
  • Supporting coastal communities’ livelihoods and boosting resilience
  • Improving nutrition and food security outcomes

• Increasingly seen as a **blue food** that can significantly advance the sustainable shift of food systems

‘It is time for the seaweed sector to play its full role in the implementation of the global Ocean Agenda
Recommendations

- Incorporate seaweed into national development planning
  - Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs)
  - Expand seaweed cultivation, restoration of degraded kelp forests, establishment of new kelp forests
    - National, subnational, local levels

- Harmonize standards globally

- For more, visit UNGC Ocean Stewardship Coalition, Seaweed as a Nature-Based Climate Solution: Vision Statement
Thank you!