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28 February 2025, at 8:00am

Lessons learned from seaweed policy frameworks around the globe

Seaweed farming is increasingly recognised as a promising avenue for sustainable economic development, environmental stewardship and social engagement. However, the success of the sector depends on establishing robust policy frameworks tailored to the unique needs of specific countries.



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South Korea has had a thriving seaweed farming sector for 50 years © Karlotta Rieve

In 2024, in collaboration with [The Nature Conservancy](#), [Hatch Blue](#)'s consulting unit (Hatch Innovation Services) analysed various stages of [seaweed](#) farming development across different regions, highlighting essential policy lessons.

The following case studies explore how policy frameworks can be tailored to support sustainable growth in seaweed aquaculture at different stages of development, using examples from mature, expanding, and nascent seaweed farming regions.

South Korea: a mature seaweed industry

[South Korea](#) is a global leader in seaweed production, particularly for its “gim” (nori) industry, which has been highlighted as its top seafood export product by the Ministry of Oceans and Fisheries. With decades of experience in cultivation, processing and exportation, South Korea’s policies focus on maintaining competitiveness while addressing evolving challenges such as climate change impacts and market diversification.

The Korean seaweed industry has greatly profited from the ongoing comprehensive support provided by the government, which involves support for seaweed farming and processing, investment in research and technology, and the exploration of international markets. Funding for genetic research to enhance seed quality has been one of the fundamental pillars of the sector’s success and resilience. For example, breeding programmes have been established to develop high-yielding strains resistant to environmental stressors such as rising water temperatures.

South Korea’s example illustrates how enhancing seed quality through policies that fund research to improve genetic quality is vital for maximising yields – something that must be urgently addressed in established tropical seaweed industries in countries such as Indonesia and the Philippines. These initiatives can ensure consistent productivity while mitigating risks associated with climate variability.

Infrastructure investments have also played a critical role. Modern processing facilities equipped with advanced drying technologies have enabled South Korea to maintain high product quality standards for export markets. The implementation of foreign technologies, promotion of automation in aquaculture facilities, and commercialisation of innovative technologies are essential. A key example of technology development is the emphasis on utilising a variety of cultivation methods, including integrated multi-trophic aquaculture (IMTA), as well as land-based and offshore aquaculture. These approaches aim to achieve both environmental and economic sustainability, especially since many nearshore regions have hit their maximum carrying capacity, a factor closely monitored by the government.

The government actively disseminates best management practices through educational programmes targeting farmers. These include guidelines on site selection, disease management, and sustainable harvesting techniques. Future plans aim to diversify applications beyond food into pharmaceuticals and bioenergy sectors.

Lessons for established seaweed sectors

South Korea underscores the importance of continuous innovation, even in mature industries. By addressing emerging challenges through adaptive policies and investing in new

technologies, South Korea aims to remain competitive in global markets while ensuring long-term sustainability.

Highlights of South Korea's seaweed farming policy			
Regulatory Framework	Supportive Infrastructure	Research & Innovation	Best Management Practices
<p>The Aquaculture Industry Development Act covers the licensing of aquaculture businesses and dedicates a chapter to the "promotion of the aquaculture industry," including Article 59, "Support for Expansion of Aquaculture Business," and Article 61, "Support for Development of Technologies Related to Aquaculture Industry."</p>	<p>Seaweed Research Institute, as a division of NIFS, is solely focused on conducting research related to seaweed, including preservation & management of aquatic plant resources and breeding & aquaculture technology research.</p>		<p>Species-specific farming guides and info material to support seaweed farming provided by the National Institute of Fisheries Science.</p>
	<p>Municipalities in South Korea invest in public awareness initiatives such as exhibitions about seaweed farming in several public spaces.</p>	<p>South Korea hosts several global seaweed conferences and fosters internal collaborations. The government has invested significantly in research and development for seaweed cultivation and processing, including studies to enhance seed materials, farming techniques, product innovation, and address environmental sustainability.</p>	

Highlights of South Korea's seaweed farming policy © Hatch Innovation Services

Norway: a growing seaweed industry

[Norway](#) has a long history of wild harvesting seaweed, while the country's seaweed farming sector is also developing. Although still relatively small compared to global leaders like South Korea, Norway has positioned itself as a key player in temperate seaweed aquaculture by drawing on its expertise in other marine industries.

The regulation of seaweed farming has been aligned with the finfish aquaculture regulations outlined in the Aquaculture Act, ensuring a clearly defined process. Licensing applications must include detailed environmental impact assessments to ensure sustainability. Nonetheless, given its complexity, there is a rising consensus that the licensing procedure designed for fish farming may not be suitable for seaweed cultivation. The absence of specific regulations tailored to seaweed farming could potentially result in delays or refusals of licences.



A kelp farm in Norway © Arctic Seaweed

The European Union, which Norway works closely with, despite not being an EU member state, has acknowledged the potential of seaweed farming through its [Blue Economy Strategy](#). This strategy includes measures such as application manuals for licensing across member states to harmonise regulations and reduce bureaucratic barriers (European Commission, 2022).

Norway has made significant investments in technology transfer programmes that bridge the gap between research institutions and industry players. The government also supports R&D initiatives to improve cultivation techniques and diversify product applications. An important milestone for the Norwegian seaweed industry was the announcement in July 2023 that the seaweed industry was incorporated into the Norwegian Fish Export Act. This modification allows the seaweed industry to utilise services the [Norwegian Seafood Council](#) offers, particularly its vital marketing promotions and overseas campaigns. Furthermore, the [Norwegian Seafood Research Fund](#) has the capacity to allocate grants for the research and development of the seaweed sector. As seen in the salmon industry, Norway's growing seaweed farming sector is focusing on building up strong supportive infrastructure including seaweed specific organisations, clusters and networks to foster engagement and innovation, attract investment, and to provide platforms that function as advocates for the seaweed farming industry.

Lessons for growing seaweed sectors

Norway offers a roadmap for how innovation-driven policies, with an emphasis on market development through export opportunities and quality standards, can justify the scaling of a farmed seaweed sector.

Highlights of Norway's seaweed farming policy			
Regulatory Framework	Supportive Infrastructure	Research & Innovation	Best Management Practices
<p>While the Aquaculture Act ensures a clearly defined process, there's increasing acknowledgement that the complex licensing procedure for fish may not be suitable for seaweed. First measure that has been taken to ease the process is an "Application assistant" manual (initiative on municipality level) which is providing insights and can function as a guide for the license application to cultivate seaweed (updating in progress).</p>	<p>Norwegian Seaweed Association and Cluster - embodies Norway's innovation ecosystem and value chain within the seaweed industry providing an excellent networking and collaboration platform.</p> <p>Norwegian Seaweed Centre: Aiming to build up a world-leading research infrastructure for seaweed science and technology. Providing equipment for research and innovation within an integrated full-scale technology platform managed by interdisciplinary research environments closely collaborating with the industrial sector.</p>	<p>The majority of Norway's seaweed research projects involve interdisciplinary collaborations between research institutions, industry partners, and government agencies, consequently the inclusion of all relevant stakeholders to bring the sector forward.</p>	<p>Training sessions and knowledge exchange on seaweed farming and production, as well as access to farming protocol templates, are being provided through initiatives like the Norwegian Seaweed Association.</p>
<p>Recent extension of the Fish Export Act to cover seaweed, i.e. officially recognizing seaweed as seafood according to Norwegian legislation, thus expanding marketing and funding opportunities.</p>	<p>The Norwegian Seaweed Biorefinery Platform: aiming is to act as a central hub for research, knowledge, methodologies, and stakeholder networks, all focused on advancing economically and environmentally sustainable biorefinery processes.</p>		<p>"Guide on the production and marketing of seaweed as food" published by the Norwegian Food Safety Authority.</p>

Highlights of Norway's seaweed farming policy © Hatch Innovation Services

New Zealand: an emerging seaweed industry

[New Zealand](#) represents a nascent seaweed farming sector, transitioning from traditional wild harvesting to commercial aquaculture. While seaweed farming is still in its infancy, pilot projects have demonstrated its potential as a high-value industry aligned with the country's blue economy aspirations. Six groups of seaweed species with commercial potential have been identified, with significant emphasis placed on integrating Māori cultural knowledge and participation into sector development ([Fisheries New Zealand, 2023](#)).

New Zealand's policy approach is deeply rooted in fostering sustainability and resilience, while also addressing barriers to entry for new players. The [Sustainable Seas National Science Challenge](#), launched in 2014, has been instrumental in optimising marine resource utilisation, while respecting environmental constraints. Within this framework, the "Building a Seaweed Sector" project was initiated in 2020 to identify growth barriers and create a roadmap for the industry's future. This initiative actively involves Māori stakeholders, ensuring cultural relevance and inclusivity. In 2019, the government released its aquaculture strategy, which explicitly identified seaweed farming as a priority area for sustainable development. Planned regulatory improvements include simplifying licensing processes and establishing clear guidelines for site selection to streamline entry into the sector. Additionally, investment in R&D has been prioritised. For example, the government has invested \$26 million in several seaweed

aquaculture initiatives, including research to develop farming and processing techniques for food, nutraceuticals, animal feed, environmental restoration, and pharmaceutical applications to address current knowledge gaps.



A kelp farm in New Zealand © GreenWave New Zealand

It has also been acknowledged that the nascent seaweed sector is currently composed of a wide array of businesses, organisations, and individuals who have diverse needs and different perspectives on the potential benefits and current challenges hindering the sector's progress. Finally, [The Aotearoa New Zealand Seaweed Association \(ANZSA\)](#), launched in 2021, aims to tackle the lack of unified leadership within the sector and serves as a collective advocate for its needs.

Lessons for other emerging regions

New Zealand's approach emphasises the integration of local knowledge systems into policy-making and fostering innovation through targeted funding and institutional support. This highlights the importance of collaboration between government agencies, industry players, researchers and indigenous communities in the early developmental phase of the seaweed sector.

Highlights of New Zealand's seaweed farming policy			
Regulatory Framework	Supportive Infrastructure	Research & Innovation	Best Management Practices
<p>Overall understanding that the success of the sector is based on a well-functioned regulatory framework across the entire value chain. Acknowledging that regulatory measures facilitate innovation and collaboration within the sector, while also advancing environmental, social, cultural, and economic values.</p>	<p>Establishment of an "advocate" for the sector's needs addressing the diverse needs and different perspectives across stakeholders - Aotearoa New Zealand Seaweed Association.</p>	<p>Strong seaweed research focus through the government supported "Sustainable Seas National Science Challenge" - 1 of 11 National Science Challenges to direct science investment towards relevant issues, fostering collaboration between researchers, businesses and non-government organizations</p>	<p>Acknowledgment that indigenous (Māori) values and practices, like kaitiakitanga (guardianship), are crucial for sustainable marine resource management. Strong focus on the integration of Maori at sector level decision making as well as to integrating mātauranga into initiatives (such as research projects) to bring the seaweed sector development forward.</p>
	<p>Implementation of an "investment roadmap" that emphasizes the needed investments, covering infrastructure and research funding.</p>	<p>Efforts to optimize pathways from research to commercialization, including regulatory components, to accelerate innovation in the sector.</p>	
<p>Efforts to reduce barriers to entry including all potential farming areas and approaches (marine & land-based).</p>			

Highlights of New Zealand's seaweed farming policy © Hatch innovation Services

Conclusions

As countries around the world explore the potential of seaweed farming, insights gleaned from comprehensive policy analyses serve as a roadmap for sustainable development. An important conclusion of this review is that facilitating the expansion of seaweed aquaculture demands the adoption of policies aimed at lowering barriers to entry for newcomers, while also prioritising sustainability to cultivate a robust sector development. This includes reducing licensing requirements and simplifying regulatory procedures.

In many countries seaweed farming falls under general fisheries or aquaculture acts, while policies specifically dedicated to seaweed are rare. By prioritising enabling policies that have been tailored to each stage of industry development – emerging, growing, or established – nations can cultivate thriving seaweed aquaculture sectors that contribute to food security and environmental sustainability.

The full report, offering comprehensive insights into seaweed farming policy, will be published by Hatch Blue and The Nature Conservancy in the coming months. It highlights key aspects connected to four areas - regulatory framework, supportive infrastructure, research and innovation, and best management practices - comparing newcomers and leading performers in the seaweed farming industry.

Additionally, The Nature Conservancy will publish policy gap analyses performed by Hatch Blue for Kenya, Tanzania and Indonesia. The Indonesian policy brief has just been released [here](#).
