

Navigating Blue Economy Diplomacy: Comparative Study of Seaweed Industry Development in Pangandaran and Serang, Indonesia

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Abstract

This article focuses on the role of the seaweed sector in supporting Indonesia's blue economy diplomacy agenda, through case studies in two coastal areas that have different potentials and challenges: Pangandaran Regency and Serang Regency. The purpose of this study was to compare the dynamics of production, management, marketing, and institutional support for the seaweed sector in both regions. In addition, this study aims to analyze how this local potential can contribute to Indonesia's broader export policy and blue economy diplomacy framework. This article uses the International Political Economy and Blue Economy Diplomacy approaches to explain the relationship between local actors, national policies, and international markets. This study used a descriptive qualitative method through in-depth interview techniques with business actors, village officials, and MSME managers in two coastal villages: Bagolo Village (Pangandaran) and Lontar Village (Serang). The analysis was carried out by comparing the management patterns, inhibiting factors, and expansion strategies of the seaweed market. The results show that both regions have large seaweed export potential, but face similar structural challenges such as limited raw materials, environmental pollution, and the absence of sustainable supporting policies. However, there are promising local initiatives such as MSME-based processed products, participation in international exhibitions, and interest in foreign markets, which can be used as a foundation for strengthening Indonesia's blue economy diplomacy from the grassroots level.

Keywords: *Blue Economy Diplomacy, Seaweed, International Political Economy, Indonesia, Pangandaran, Serang.*

INTRODUCTION

Indonesia as the largest archipelagic country in the world has great potential in the development of the marine sector as one of the backbones of the national economy. One of the strategic commodities of this sector is seaweed, which not only plays a role in supporting the economies of coastal communities, but also becomes an important part of Indonesia's export policy and blue economy diplomacy strategy

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(Ministry of Marine Affairs and Fisheries, 2020; OECD, 2021). In the global context, seaweed is recognized as a future food source, industrial raw material, and environmentally friendly ecological solution (FAO, 2020). Therefore, sustainable seaweed management has a dual role: strengthening local economic resilience and increasing Indonesia's diplomatic competitiveness in the international arena (Novikova et al., 2021).

However, the development of the seaweed sector at the local level is often faced with structural challenges, such as limited raw materials, lack of cultivation technology, weak institutional support, and lack of integration into the global value chain (Nur, 2022; Andriyani et al., 2023). This is reflected in conditions in various coastal areas of Indonesia, including in Pangandaran Regency (West Java) and Serang Regency (Banten), two areas that have abundant marine resource potential but have not been optimally utilized for export purposes (Ismail et al., 2022).

Although studies on seaweed development have been conducted in the context of local economies, most of the literature is still technical and agronomist. These studies have not adequately highlighted the linkage between local dynamics and the direction of Indonesia's foreign policy, particularly in the framework of blue economy diplomacy. In addition, the lack of a comparative approach between coastal regions also leaves a gap in understanding how local variation can contribute to the formation of a more inclusive and grassroots-based national export strategy.

This research offers an interdisciplinary approach that combines international political economy analysis with the concept of blue economy diplomacy in the context of seaweed commodity development at the local level. The novelty lies in the comparative analysis based on field studies between two districts with different geographical and social characteristics, as well as in the exploration of how the capacity of MSMEs and village actors can be an integral part of Indonesia's economic diplomacy narrative. This research also expands the framework of thought that economic diplomacy is not only determined by state actors, but also by grassroots actors who play a role in shaping Indonesia's image and position in the global value chain.

This study departs from the need to understand how the management of the seaweed sector in the two regions can make a strategic contribution to strengthening Indonesia's blue economy diplomacy. With a case comparison approach, this study explores local dynamics in seaweed production and processing, forms of community and MSME participation, and the extent to which local and national government policies encourage the integration of local products into the global market (Sovacool et al., 2022).

This research is important in order to fill the gap in the literature on the role of sub-national actors in supporting economic-based foreign policy (Acharya, 2014; Nye, 2004). In addition, this article also contributes to Indonesia's transition efforts towards an inclusive and

sustainable blue economy, by making seaweed one of the icons of Indonesia's maritime economic diplomacy at the international level (Patil et al., 2018).

LITERATURE REVIEW

Blue Economy Diplomacy

The concept of blue economy diplomacy refers to a country's strategy in harnessing the potential of the ocean to support national interests in the international context, including trade, investment, and sustainable development (Patil et al., 2018; World Bank, 2021). Indonesia as a maritime country has adopted this approach through various marine policies and blue economy initiatives such as the Indonesia Ocean Policy and the Blue Economy Roadmap.

In this context, seaweed commodities are positioned not only as export products, but as instruments of diplomacy that reflect Indonesia's commitment to sustainable development goals (SDG 14: Life Below Water), improving coastal welfare, and global food security (FAO, 2020). Blue economy diplomacy also implies multilevel relationships between central and local actors, as well as interactions between countries, markets, and communities.

International Political Economy (IPE)

IPE as a theoretical approach provides a framework for understanding how power and markets influence each other in the production and distribution of global commodities (Gilpin, 2001; Ravenhill, 2020). In the context of seaweed, IPEs help analyze how trade regulations, government incentive structures, central-regional relations, and global production structures (e.g. value chains) affect the ability of regions such as Pangandaran and Serang to participate in export markets.

In addition, the IPE approach allows the articulation of the role of non-state actors such as MSMEs, villages, and cooperatives in the international economic process, including in shaping bottom-up diplomacy. This is in line with the constructivist approach in IPE which sees norms, local identities, and community values as part of the dynamics of global economic politics (Acharya, 2014; Blyth, 2002).

Conceptual Slice: Blue Economy Diplomacy in the International Political Economy Framework

Blue economy diplomacy is not a separate entity from international political economy (IPE), but rather one of the contemporary expressions of the transformation of relations between countries, markets, and communities in the context of marine resources. Within the framework of IPE, blue economy diplomacy can be understood as a state strategy in projecting national economic interests through the sustainable use of marine resources, while responding to global pressures related to green trade, climate change,

and the sustainability of marine ecosystems (Patil et al., 2018; Sovacool et al., 2022).

Substantially, blue economy diplomacy reflects countries' efforts to maintain the competitiveness of their marine commodities in a global economic architecture that increasingly emphasizes sustainability standards, eco-certification, and traceability requirements (World Bank, 2021). In this regard, Indonesia faces the challenge not only to increase the volume of seaweed exports, but also to meet the demands of an increasingly complex and politically connected global market.

The IPE approach also highlights how blue economy diplomacy is not only run by foreign policy elites, but is also determined by the structure of the domestic economy, the power imbalance between the central and regional governments, and the ability of local actors to connect to global markets. As stated by Gilpin (2001), the relationship between the state and the market is mutually shaped and influenced by the global structure of production and distribution. In the context of seaweed, this means that the ability of coastal villages such as Bagolo and Lontar to contribute to Indonesia's economic diplomacy is greatly influenced by their access to technology, capital, markets, and regulations that are cross-scale.

Furthermore, blue economy diplomacy in IPE must also be understood in the context of competition and negotiations between countries in determining the ocean governance regime. Maritime countries such as Indonesia are using the blue economy narrative not only to attract investment, but also to strengthen their bargaining positions in multilateral forums, while also asserting their identity as the world's maritime axis country.

Thus, the IPE framework allows researchers to map how Indonesia's blue economy diplomacy strategy runs vertically (from the center to the region) and horizontally (from local to global), as well as how seaweed becomes a concrete medium of articulating national interests in the ocean-based global economic order.

METHOD

This research adopts a descriptive qualitative approach with a comparative case study design, focusing on two coastal areas in Indonesia: Bagolo Village in Pangandaran Regency, West Java Province, and Lontar Village in Serang Regency, Banten Province. These two locations were selected due to their differing geographical characteristics but shared reliance on seaweed as a significant component of the local economy. Their inclusion in this study is also relevant to the broader context of community-based blue economy diplomacy.

Data collection was conducted through three main techniques. First, direct field observations were carried out at Karapyak Beach (Bagolo) and Lontar Beach (Serang) to observe the physical environment, coastal community activities, and existing seaweed processing infrastructure. Second, in-depth interviews were conducted

with key informants involved in seaweed governance and development. In Bagolo Village, the interviewees included the village secretary, seaweed MSME owners (UP2K-PKK group), and the head of the Poklahsar Ulfaqu group responsible for seaweed processing and marketing. In Lontar Village, interviews were held with village officials (Mr. Rochman and Mr. Hendi), local seaweed farmers, and residents impacted by industrial pollution and coastal environmental changes.

The main research instrument used was a semi-structured interview guide, designed to explore key themes such as seaweed management practices, production challenges, government support, export potential, and local strategies for accessing the market.

The collected data were analyzed using thematic analysis with a comparative lens. The process included coding the interview transcripts and field notes, categorizing key issues in each location (such as raw material availability, pollution, market access, and institutional support), and conducting a cross-case comparison to identify patterns, similarities, and differences that contribute to local strategies in blue economy diplomacy.

To ensure data credibility, source triangulation was conducted by cross-checking information from interviews, observations, and relevant supporting documents. The findings were also compared with existing literature and secondary data to strengthen the interpretation and validity of the research results.

RESULTS AND DISCUSSION

Location of Study Characteristics

Bagolo Village is located in Kalipucang Sub-district, Pangandaran Regency, West Java Indonesia. Within the village lies a white sand rocky beach known as Karapyak Beach. This beach is a habitat for several types of seaweed, such as *Ulva*, *Gelidium*, *Sargassum*, and *Gracilaria*. Besides rocky substrate, this beach also has large and strong waves. These physical conditions prevent local fishermen to develop seaweed cultivation and depends much on natural harvesting. The villagers' livelihoods are farming, fishing, laborers, and employees. A small number of people process coconut sugar and some process natural seaweed into snacks and dried seaweed.

Lontar Village is located on the north coast of Java Island, precisely in Tirtayasa Sub-district, Serang Regency, Banten. The villagers work as fishermen, seaweed farmers, salt farmers, laborers and employees. The village is one of the centers of *Kappaphycus alvarezii* seaweed cultivation. Seaweed farmers use a long line cultivation system and sell their harvest to collectors in both fresh and dried form. Seaweed processing businesses into processed food products such as dodol, crackers and sticks had existed but did not develop.

Bagolo Village (Pangandaran Regency) and Lontar Village (Serang Regency), both of which depend on seaweed commodities for part of their local economies. The findings are grouped into four main themes

that emerged from the thematic analysis: (1) the potential and products of seaweed, (2) structural constraints, (3) institutional support, and (4) connectivity to global markets which is summarized in Table 1.

1. Potential and Seaweed Products

Both regions show significant seaweed production potential, both in the form of raw materials and processed products. In Bagolo Village, processed products such as seaweed chips, shredded meat, soy sauce, and sauce have been developed by local MSME groups such as Poklahsar Ulfaqu and UP2K-PKK. Meanwhile, in Lontar Village, processing is still simple and mostly focused on selling raw seaweed. However, in both locations, local communities have a strong understanding of the economic value of seaweed as well as a desire to expand their markets, including to the international level.

2. Structural Constraints

The study found that dependence on nature is a major obstacle in Bagolo Village, where seaweed can only be taken at low tide, and marine aquaculture cannot be carried out due to geographical conditions (steep beaches). Meanwhile, Lontar Village faces environmental pollution from industrial waste (especially from the Cilegon and Ciujung River areas), which directly damages seaweed habitat and reduces harvest quality. Both regions also face fluctuating raw material problems, as well as low processing and packaging technology capacity, which affects product quality and competitiveness.

3. Institutional Support

Support from local governments appears to be uneven and has not been systemically structured. In Pangandaran, the government provides packaging training and production house facilities, but has not touched on the aspects of production and export certification. In Serang, communities experience a gap in support in terms of coastal ecosystem rehabilitation and protection against industrial pollution. There are also administrative barriers, such as high costs to obtain halal supervisors and product certification, as well as limited access to small-scale financing programs.

4. Connectivity to the Global Market

Although exports have not taken place on a regular basis, both locations have experienced symbolic engagement with global markets. Products from Bagolo Village were exhibited in an international bazaar in Singapore through the facilitation of BJB and the Sekoper Cinta program, but were still constrained by the supply of raw materials and administrative unpreparedness for export. In Serang, the discourse on exports is hampered by the declining quality of the environment.

Table 1. Thematic Comparison Analysis of Seaweed-based Local Economy

Comparative Analysis	Location	
	Bagolo	Lontar
Potential Products	Diverse seaweed-based processed products	Raw seaweed, less processing innovation
Constraints	Rocky beach and heavy tide limit on site farming technology	Industrial and domestic pollutions
	Low-tech processing and packaging	Low-tech processing and packaging
	Seasonal supply and dependency to wild seaweed stock	Long supply chain
	Export-related certification (Halal, HACCP etc.)	Export-related certification (Halal, HACCP etc.)
Institutional Support	Weak support for product certification	Weak support for product certification
	High administrative barrier for financial	High administrative barrier for financial
Access to Global Market	Language barrier	Language barrier
	Access and connection through exhibition: SG FAIR	Low entry point access

The results show that although Bagolo Village (Pangandaran) and Lontar Village (Serang) have different geographical and environmental characteristics, they both display a similar pattern in the management of seaweed commodities: high economic potential but not yet optimally integrated into the global value chain. These findings can be read through two main conceptual lenses in this study: blue economy diplomacy and international political economy (Figure 2):

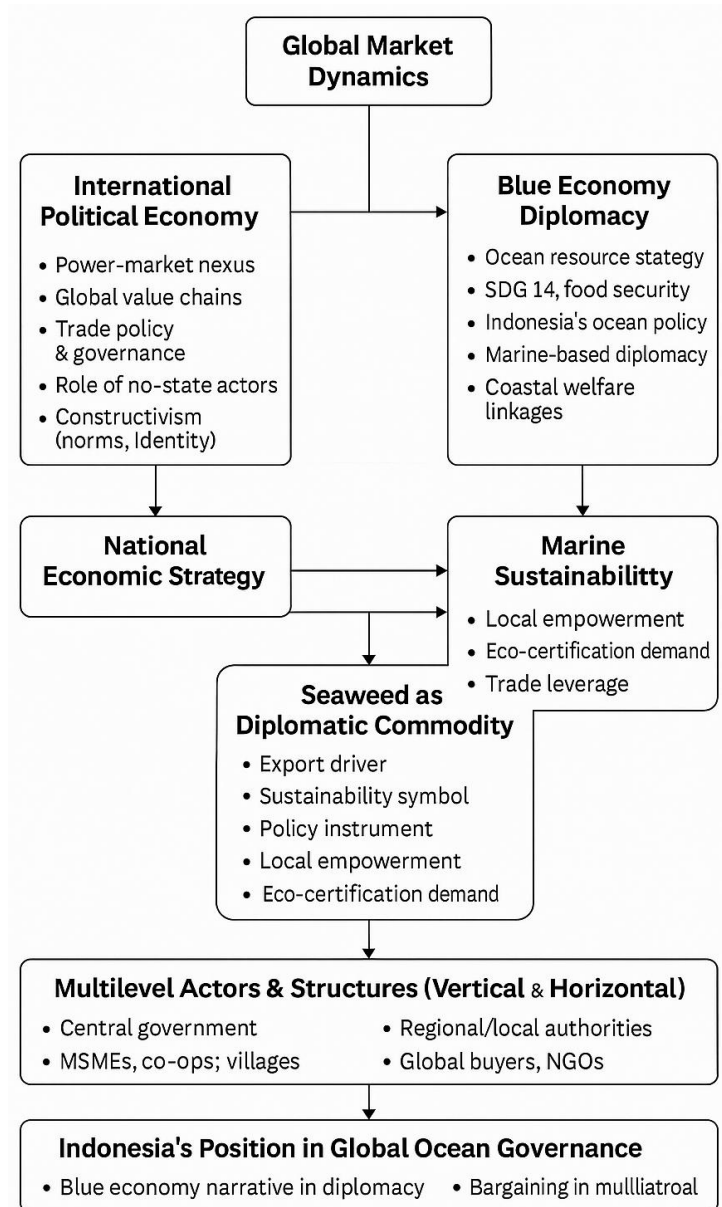


Figure 2. Theoretical Framework of Blue Economy and International Political Economy

Blue Economy Diplomacy: Between Local Potential and the Global Agenda

In the context of blue economy diplomacy, seaweed should not only be seen as a local commodity, but also as a strategic instrument for Indonesia to strengthen its position in the global marine economy. However, the results of this study show that the blue economy agenda is not yet fully connected to economic dynamics at the grassroots level.

Bagolo Village has demonstrated initiatives to develop seaweed-based processed products and explore overseas markets through participation in international exhibitions. However, the lack of availability of raw materials and limited institutional support suggest that there is a large gap between the vision of national blue economy

diplomacy and the readiness of local infrastructure. The same thing can also be seen in Lontar Village, where environmental pollution from large industrial estates is actually the main obstacle to community participation in a sustainable blue economy.

Thus, blue economy diplomacy is still top-down and has not taken into account local complexities that are important prerequisites for the success of marine-based foreign economic strategies.

International Political Economy: Structural Inequality and the Role of Local Actors

From the perspective of international political economy, this study underscores how global economic structures and national policies can create inequality of access to and distribution of marine economic benefits. On the one hand, Indonesia encourages the export of marine products as part of its growth and diplomacy strategy. On the other hand, local actors such as coastal MSMEs still face significant structural barriers, ranging from capital, certification, to market access.

This condition reflects power asymmetry in the global economic system, where local actors are faced with global standards and expectations without being equipped with adequate domestic support. As stated by Gilpin (2001), the global economy is not a neutral space, but a terrain influenced by power, institutions, and access to resources. In this context, coastal communities in Bagolo and Lontar are not only producers of production, but also victims of systemic inequalities that hinder their participation in economic diplomacy.

Actualization Bottom-up Diplomacy

One of the important contributions of these findings is the potential for bottom-up diplomacy. Initiatives undertaken by local MSMEs—such as processing of creative products, involvement in international exhibitions, to informal networking with banking institutions and local governments—demonstrate the existence of diplomatic capacity outside state actors.

However, to strategically actualize this potential, a cross-scale policy is needed that is able to connect local actors with international networks through the support of integrated regulations, logistics, technology, and economic diplomacy.

This research produced several important findings that underscore the linkage between local dynamics of seaweed management and the national agenda in blue economy diplomacy. The findings are divided into five main points:

1. High but Not Yet Integrated Local Economic Potential

Both Bagolo Village (Pangandaran) and Lontar Village (Serang) show great potential in the management and utilization of seaweed, both as a raw commodity and processed products. The local community shows quite progressive entrepreneurial initiatives, including in the development of derivative products and participation in overseas exhibition activities. However, there

is no integrative strategy that connects this local potential with the direction of national export policies.

2. Structural Constraints Are Systemic and Local-Specific

Both locations face serious structural constraints: Bagolo Village is hampered by topographical limitations that do not support cultivation, while Lontar Village is disturbed by environmental pollution from industrial areas. Raw material constraints, weather fluctuations, limited production equipment, and product certification costs are recurring common obstacles in the two locations.

3. Lack of Strategic Role of Local Governments in the Global Value Chain

Despite sporadic support from local governments—such as packaging training or production house assistance—there has been no long-term policy that makes seaweed part of regional development planning that is integrated with the global market. The village government still relies on collective awareness without a written regulatory framework.

4. Local Community Involvement Shows the Potential for Grassroots Diplomacy

The involvement of MSMEs in product promotion activities (such as bazaars in Singapore), the use of English-language branding, and efforts to establish partnerships with local financial institutions (such as BJB Kredit Mesra) demonstrate the capacity for bottom-up diplomacy. However, this capacity is still limited by weak support structures and a lack of strategic recognition from the central government.

5. Seaweed as a Medium of Indonesian Diplomatic Representation

This study shows that seaweed is not only an economic commodity, but also has the potential to become an instrument of symbolic diplomacy for Indonesia within the framework of the blue economy. By improving the quality, sustainability, and bargaining position of these commodities, Indonesia can strengthen the narrative of maritime diplomacy that is inclusive and based on the strength of local communities.

CONCLUSION

This study shows that seaweed management in Bagolo Village (Pangandaran) and Lontar Village (Serang) could become example local portrait of the complexity of the relationship between local potential, national structure, and global market dynamics. Both regions have strong resource capacity and community initiatives but are still constrained by structural barriers such as access to raw materials, environmental pollution, weak institutions, and limited market access.

Through the lens of blue economy diplomacy, it was found that the involvement of local communities in the development and promotion of seaweed can be part of Indonesia's diplomatic narrative based on inclusion and sustainability. However, to realize this potential, policies

are needed that connect grassroots with macro support systems—both through regulations, incentives, and protection of coastal ecosystems.

The study confirms that economic diplomacy is not only determined by state actors in international forums, but also by the capacity of local communities to manage and represent their flagship products in the global economic architecture. Commodities such as seaweed have strategic value not only from an economic perspective, but also as a symbol of Indonesia's position as an active and progressive maritime country in the global order.

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