



Indonesian Lobster Trade: Trends and Comparative Advantage

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ABSTRACT

This study aimed to analyze the sustainability, trends, and competitiveness of Indonesian lobster exports to China, the main destination country, compared to Vietnam. Research data for the 2019-2023 period were analyzed using trend analysis and revealed comparative advantage (RCA). The results show that Indonesia's lobster exports to the world are showing a downward trend, although exports to China are showing an upward trend. On the other hand, Vietnam exhibits significant fluctuations in its lobster exports to both the world and China. RCA analysis shows that Indonesia has a comparative advantage in lobster exports to the world market, while Vietnam's comparative advantage declined drastically in 2023.

INTRODUCTION

Increasing global food consumption, particularly in the fisheries sector, along with bilateral trade cooperation and the expansion of trade routes in general, have opened up market opportunities for Indonesian lobster commodities. The global lobster market was projected to grow by approximately \$7.83 billion in 2024 (ITC calculation based on UN), while the value of Indonesian lobster exports in the same year was estimated at approximately \$91.79 million (**KKP, 2024**). Indonesia possesses abundant lobster seed resources, but faces challenges such as overfishing, supply fluctuations, and price fluctuations. In the regulatory realm, Indonesia has experienced several regulatory changes related to lobster seed exports, which are suspected to have caused fluctuations in the quantity of lobster exports and lobster seeds to destination countries. Indonesian lobsters are exported to China, the main destination, while lobster seeds are exported to Vietnam, Hong Kong, Singapore, and several other countries. Vietnam, as an importer of Indonesian lobster seeds, is Indonesia's main competitor in lobster exports to China. The Ministry of Maritime Affairs and Fisheries reported that in 2022, the value of Indonesian lobster exports would reach 25.70 million USD (**KKP, 2023a**). This value was obtained from an export volume of 1,469.56 tons. This figure shows a decrease of 10.19% compared to 2021 which reached 28.62 million USD. Lobster export volume also decreased by 25.02% compared to the previous year which recorded an export volume of 1,959.91 tonnes in 2021. During the 2012-2022 period, Indonesian lobster exports tended to experience

deformation. The highest achievement was recorded in 2020 with an export value reaching 76.11 million USD. Even so, the contribution of lobster exports to Indonesia's total fisheries export volume in 2022 only reached 0.12% of the total fishery export volume of 1.22 million tons (KKP, 2023a, b).

Indonesian lobster production is greatly influenced by catches lobster, since lobster cultivation in Indonesia is still not developed (Revindo & Devianto, 2019). Indonesia is a major exporter of lobster seeds, especially to export destination countries such as Vietnam, Hong Kong, Singapore, Thailand, Brunei Darussalam, and Malaysia. The types of lobster generally exported are the sand lobster (*Panulirus homarus*) and pearl lobster (*P. Ornatus*). High quantity and the frequency of demand for lobster seeds from outside Indonesia causes seed prices to increase drastically. Around 2016, the price of 2- 3cm seeds ranged between IDR 2,000 – 2,500 per head. In 2017 demand for seeds for export increased, which resulted in the price of seeds also becoming more expensive, namely around IDR 13,000 per head in July 2017 and reached IDR 17,000 - 20,000, per head in December 2018 (Tirtadanu *et al.*, 2021). Lobster prices at the marketing channel level varies according to the percentage. The location of the exporter is the main pillar in determining prices. Price of lobsters sold depends on type, size, physical condition of the lobster and season (Lestari *et al.*, 2023).

High demand for seeds and expensive seed prices, causes people to choose to directly sell the resulting seeds catch rather than carrying out aquaculture activities. Generally, the consumption size of lobsters is relatively large compared to other marine commodities. The price of consumption-sized lobsters (>500 grams) ranges from US\$65–80 in Jakarta and Bali, while the selling price for lobsters of the same size at the cultivator level in Vietnam is higher, ranging from US\$90–120.

Table 1. Indonesia, Vietnam and World Lobster Exports (HS 030631) (USD 1,000)

Year	Indonesia lobster export	Vietnam export	World export
2019	30,122	15,620	972,760
2020	71,437	104,631	768,350
2021	24,595	22,959	709,335
2022	20,352	164,957	828,702
2023	20,279	12,295	800,612

Source: UN Comtrade (2024).

The technology for cultivating lobster rearing in Indonesia has not yet been developed. This is one of the main factors that encourage people to choose selling lobster seeds. Lobster rearing activities are still being developed in the community, however they still face many obstacles, including food availability, disease, and relatively long maintenance time. Meanwhile, lobster fishing activities and continuous export of seeds in increasing quantities in the long term can cause a decline in seed stocks in nature if management lacks direction and control. The policy regarding the prohibition and permission of lobster seed exports in Indonesia has undergone several changes. One of the government's efforts to control the lobster commodity was the issuance of the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 56/Permen-KP/2016 concerning the Prohibition of Catching and/or Extracting Lobsters (*Panulirus* spp.), Crabs (*Scylla* spp.), and Blue Swimming Crabs (*Portunus* spp.) from the

territorial waters of the Republic of Indonesia (**Tirtadanu *et al.*, 2021**). This regulation specifies the allowable sizes of lobsters for export and prohibits the export of spawning lobsters in order to preserve the species and allow them time to reproduce before being caught and traded.

Changes in regulations related to lobster fishing—particularly the prohibition on the export of lobster seeds for cultivation (**Sari & Djumena, 2024**)—have significantly affected the value of Indonesia's lobster exports. To maintain the existence and availability of lobster populations, Regulation No. 56 of 2016 prohibited the capture and export of lobsters, crabs, and swimming crabs from Indonesian waters. However, the ban on lobster seed exports did not have a positive impact on lobster exports, especially in the absence of domestic rearing facilities.

Subsequently, this regulation was revoked and replaced by the Minister of Maritime Affairs and Fisheries Regulation No. 12/PERMEN-KP/2020, which allowed the export of lobster seeds under certain conditions, thus opening opportunities for international seed trade. Later, Regulation No. 17 of 2021 restricted the export and movement of lobster seeds to encourage domestic lobster cultivation. This was eventually replaced by Regulation No. 7 of 2024, which permits lobster seed cultivation, both within and outside the territory of the Republic of Indonesia. This policy has generated significant debate, particularly from a sustainability perspective, as overexploitation of lobster seeds could have detrimental effects on Indonesia's marine resources.

Lobster seeds are mostly exported to Vietnam, where they are cultivated, resulting in greater added value for Vietnam compared to Indonesia (**Kyaw, 2022**). Vietnamese lobster export data show fluctuations (Table 1), which are believed to be influenced by Indonesia's regulatory changes banning seed exports. Indonesia has strong export potential in the international market, particularly with China as a major destination. Meanwhile, regulatory changes regarding the capture, export, and cultivation of lobsters and lobster seeds over the past decade have had fluctuating impacts on lobster seed export activities and farmers outside Indonesia—especially in Vietnam, which relies heavily on Indonesian seed supplies (**Rossa *et al.*, 2021**).

Faruqi and Ervani (2024) employed a panel regression approach and the revealed comparative advantage (RCA) index to examine the competitiveness and influencing factors of Indonesia's lobster exports. Therefore, this study aimed to analyze the trends and competitiveness of Indonesian lobster exports compared to Vietnam in the global market using the RCA approach.

MATERIALS AND METHODS

This research used UN Comtrade, ITC Trade Map and KKP data with HS Code at six-digit level namely 030631 from 2018-2023. Time series data analysis using trend analysis was carried out to determine the trend of Indonesian and Vietnamese lobster exports over the last five years. Analysis of lobster export share was carried out using the revealed comparative advantage (RCA) method. RCA was used to measure a country's comparative advantage (**Siggel, 2006**), based on the ratio of a country's export advantage in certain commodities compared to world exports.

$$RCA_{ij} = (X_i/X_w) / (X_{ij}/X_{wj})$$

X_{ij} = i^{th} country's export of commodity j .

X_{wj} = world exports of commodity j .

X_i = total exports of country i .

X_w = total world exports

$RCA_{ij} > 1$ indicates country I has a comparative advantage in export of j ; the greater the index, the stronger the advantage. $RCA_{ij} < 1$ indicates that country I has a comparative disadvantage in export of j ; the smaller the index, the greater the disadvantage.

RESULTS

UN Comtrade 2010-2021 data shows that there are three countries that are world lobster exporters from the Southeast Asia region, namely Indonesia, Vietnam and Malaysia, where Indonesia ranks first for the HS code 030631 in 2020 worth 71.44 million US\$ of the total lobster export value of 76.11 million US\$ (Gea *et al.*, 2023). In the same year, Vietnam's exports were twice as large as Indonesia's, with a total export value of US\$ 149.43 million.

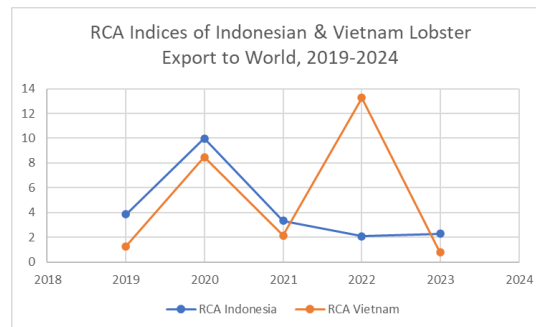


Fig. 1. RCA indices of Indonesian and Vietnam lobster export to world, 2018-2023

In this study, the RCA index was used to measure Indonesia's and Vietnam's RCA in exporting lobster (Fig. 1). Indonesia's exported lobster to the world has RCA in all the years considered in the study period (2019–2023) (Table 2).

Table 2. Indonesia – World RCA (HS 030631) (USD 1,000)

Year	Indonesian Lobster Export	World Lobster Export	Total Indonesian Export	Total World Export	Indonesia – World RCA
2019	31,122	872,760	167,682,996	18,768,145,957	3.86
2020	71,437	768,350	163,306,490	17,521,362,527	9.97
2021	24,595	709,335	231,587,887	22,158,013,142	3.32
2022	20,352	828,702	291,979,103	24,721,614,976	2.08
2023	20,279	800,612	258,797,196	23,266,804,004	2.28

Indonesia's RCA value has fluctuated over the years, increasing significantly from 3.86 in 2019 to a high of 9.97 in 2020. After 2020, the Indonesia's RCA gradually declined from 9.97 to 3.32, then 2.0 and 2.28 in 2023, which implies that Indonesian lobster exports to the world are becoming less competitive. However, RCA results >1 indicate that

Indonesia still has a comparative advantage in lobster exports to the world. Vietnam also experienced the same thing, RCA Vietnam showed that Vietnam's lobster exports had a comparative advantage with high fluctuations from year to year during 2019-2023 (Table 3).

Table 3. Vietnam – World RCA (HS 030631) (USD 1,000)

Year	Vietnam Lobster Export	World Lobster Export	Total Vietnam Export	Total World Export	Vietnam – World RCA
2019	15,620	872,760	264,610,323	18,768,145,957	1.27
2020	104,631	768,350	281,441,457	17,521,362,527	8.48
2021	22,959	709,335	335,792,598	22,158,013,142	2.14
2022	164,957	828,702	370,909,157	24,721,614,976	13.27
2023	12,295	800,612	452,448,829	23,266,804,004	0.79

The development trend of Indonesia's non-oil and gas exports in 2019-2023 was 15.76%, meanwhile Indonesia's non-oil and gas exports to China in the same period showed a percentage of 28.51% (**Ministry of Trade, 2024**). This shows that Indonesia-China trade in the non-oil and gas sector is growing very significantly. In the fisheries sector, Indonesia is a major exporter of lobster seeds, especially to export destination countries such as China, Vietnam, Hong Kong, Singapore, Thailand, Brunei Darussalam and Malaysia (**Trade Map, 2024a, b**). The types of lobster that are generally exported are *Panulirus homarus* (sand lobster) and *P. Ornatus* (pearl lobster) (**KKP, 2023a, b, 2024**). Indonesia showed a trend of lobster exports experiencing a drastic decline in 2021 (Fig. 2). Meanwhile, the trend of Indonesian lobster exports to the main destination country, namely China, showed an upward trend of 28.51% (Fig. 3)

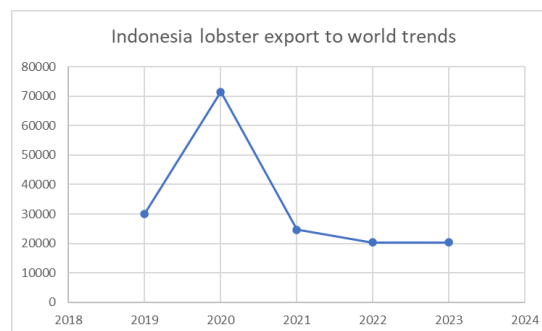


Fig. 2. Indonesian lobster export to world trends 2018-2023

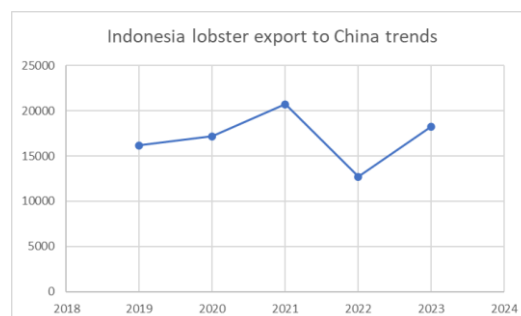
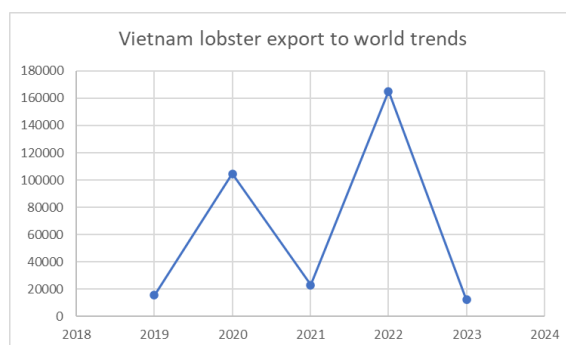
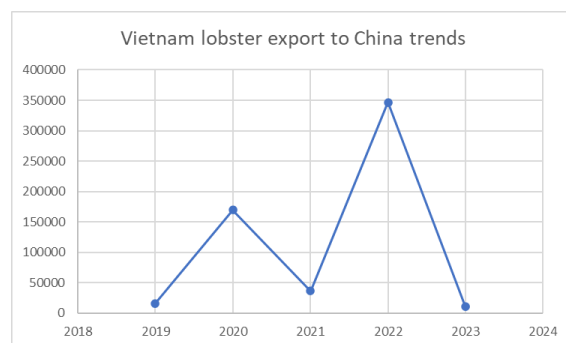


Fig. 3. Indonesian lobster export to China trends 2018-2023

The high quantity and frequency of demand for lobster seeds from abroad has caused the price of lobster seeds to rise drastically; this has attracted exporters to increase their production. The large-scale export of lobster seeds has an impact on environmental conditions. Lobsters live and develop in coral reefs. Indonesia has waters dominated by coral reefs, making it the best habitat for lobsters. However, if lobster fishing is carried out using fishing gear that is not environmentally friendly, it will cause damage to coral reefs and threaten the survival of other marine biota that live in these coral reefs. Lobsters are a category of germplasm whose genetics cannot be engineered by humans. The activity of catching and exporting lobster seeds which is carried out massively and without supervision in the long term can cause significant extinction (**Rossa *et al.*, 2021**). The high demand for seeds and expensive seed prices led people to directly sell the seeds they catch rather than carrying out cultivation activities (**Saria, 2022**). Meanwhile, the price of consumption-sized lobsters is also relatively high compared to other marine commodities in general.

Vietnamese lobster exports to China have increased significantly over the past ten years, particularly after Indonesia relaxed its lobster seed export policy. This has allowed Vietnam to dominate the Chinese lobster market, which is currently the largest market for Vietnamese lobsters, with a market share of approximately 98-99%. The trend of Vietnam's lobster exports to the world (Fig. 4) shows a fluctuating graph.

**Fig. 4.** Vietnam lobster export to world trends 2018-2023**Fig. 5.** Vietnam lobster export to China trends 2018-2023

Vietnam has successfully developed a very large lobster farming industry, although most of the seeds are obtained from overseas sources. Following the ban on Indonesian

lobster seed exports in 2016, lobster cultivation in Vietnam experienced a drastic decline. (Fig. 5). Before 2019, Vietnam's lobster exports to China were relatively low. However, after Indonesia legalized the export of lobster seeds, Vietnam was able to export more than 800 tons of lobster to China each month, significantly higher than the previous figure of less than 100 tons per month. This is likely due to the cessation of lobster seed supplies from Indonesia.

DISCUSSION

Lobster fishing is one of Indonesia's high-value fisheries sectors, contributing significantly to the coastal economy and fishery commodity exports. However, unsustainable fishing practices, such as the exploitation of lobster seeds and the use of environmentally unfriendly fishing gear, have put significant pressure on natural stocks. Based on the Ministerial Decree No. 28 of 2024, the potential lobster seed stock in Indonesian Waters is estimated at 465 million, with a catch quota set at 90% of the total potential. This policy has drawn criticism as it is considered too high and could threaten the sustainability of wild stocks. In the context of the Sustainable Development Goals, lobster management must prioritize a balance between economic utilization and marine ecosystem conservation. Sustainability emphasizes the importance of reducing overexploitation, protecting coastal ecosystems, and increasing the capacity of fishing communities in sustainable fishing practices. Therefore, understanding lobster fishing patterns in Indonesia is crucial to assessing the extent to which these practices support or hinder the achievement of marine sustainability goals.

Indonesian lobster fishing and trade exhibit two main flows: the export of live lobsters and consumer products to major markets such as China, and the flow of lobster seeds historically destined for Vietnam and other aquaculture destinations. The trend of Indonesian lobster exports showed a drastic decline in 2021. This is likely since lobster exports are extremely dependent on catches and not cultivation (**Tirtadanu *et al.*, 2021**). In that year, government policy triggered Indonesian exporters to sell lobster seeds and not lobsters for consumption (**Kameliaaisya *et al.*, 2005**; **Pemprov Kalimantan Timur, n.d.**; **Tirtadanu *et al.*, 2021**). Meanwhile, the trend of Indonesian lobster exports to the main destination country, namely China, shows an upward trend of 28.51% (**Ministry of Trade, 2024**). This is in line with the findings of **Soumya and Yeledhalli (2021)** and **Faruqi and Ervani (2024)**, where the trend of Indonesian commodity exports for HS code 03 since 2018 has fluctuated and tends to increase.

Indonesia is a supplier of lobster seeds to Vietnam (**Wahyudi & Maipita, 2018**; **Rossa *et al.*, 2021**; **Rahayu *et al.*, 2023**). The trade in Indonesian lobster seeds to Vietnam over the past few years has encouraged the emergence of fishing patterns focused on puerulus/seed collection - often by small-scale fishers using easy and quick methods- thus increasing wild seed production as an economic commodity. One of the government's efforts to control the lobster industry was the issuance of the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 56/Permen-KP/2016 concerning the Prohibition of Catching and/or Releasing Lobsters (*Panulirus* spp.), Crabs

(*Scylla* spp.), and Blue Swimming Crabs (*Portunus* spp.) from the territorial waters of the Republic of Indonesia (Kyaw, 2022; Saria, 2022). This regulation defines the allowable sizes of lobsters that may be exported and prohibits the export of egg-bearing lobsters to ensure that these marine species have the opportunity to reproduce before being caught and sold (Ilmiah & Oktora, 2021).

The government briefly reopened lobster seed exports under the condition of mandatory aquaculture investment (the “export with investment” scheme) and issued cultivation licenses to several Vietnamese companies operating in Indonesia. While this policy strengthened the flow of seed commercialization, it also created strong market incentives for the collection of wild seeds. In 2020, the Indonesian government reinstated the ban on lobster seed exports (Ilmiah & Oktora, 2021). That same year, Vietnam’s export figures showed a significant increase, suggesting that the competitiveness of Vietnamese lobster products in the international market had risen further. According to data from the Food and Agriculture Organization (FAO), Vietnam ranked first among global producers of cultivated lobsters, followed by Indonesia.

In 2021, regulatory changes once again opened the door for lobster seed exports (Saria, 2022). However, in 2022, the government reimposed the export ban, only to announce plans to reopen it again in early 2024 (Anisah, 2024; Sari & Djumena, 2024). Corresponding to these shifting policies, Vietnam’s lobster export trends have fluctuated—one of the key influencing factors being the availability of lobster seeds from Indonesia.

From the perspective of catch patterns, the surge in demand has driven fishers to harvest large quantities of fry—often without regard to size or reproductive periods—due to high prices and short-term income opportunities. Dependence on wild fry collection has altered fishing behavior: the timing and location of catches have shifted toward nursery habitats (seagrass beds and reef fringes) during puerulus migration, the use of intensive fishing gear has increased, and fishing pressure during the larval-to-juvenile transition period has intensified. As a result, the supply of wild fry has declined in subsequent seasons, creating fluctuations in availability for fishers who depend on this source of income.

Governance challenges have further exacerbated ecological impacts. Fluctuating policies—including shifting export permits and investment requirements—create uncertainty and opportunities for illegal actors, while efforts to strengthen domestic aquaculture development lag behind the rate of wild seed collection. Consequently, despite promising pilot projects in cultivation and early harvests, seed collection remains dominant due to technical, financial, and marketing barriers to large-scale aquaculture.

The socio-economic impacts are multifaceted. While income from seed sales temporarily alleviates poverty among coastal households, stock depletion threatens long-term livelihoods, local food security, and the potential for domestic value addition—since seeds are often exported for rearing and later re-imported as finished products. Furthermore, Indonesia incurs significant economic losses from smuggling and illegal practices, which erode potential national revenues and undermine sustainable resource management.

CONCLUSION

Indonesia and Vietnam both possess a revealed comparative advantage (RCA) in exporting lobsters to the global market. Specifically, Indonesia has a comparative advantage in exporting crustaceans—live, fresh, or chilled rock lobsters and other sea crawfish (*Palinurus* spp., *Panulirus* spp., *Jasus* spp.)—whether in shell or not. However, the issue of exporting Indonesian lobster seeds represents only a small part of the broader challenges within the marine and fisheries sector, namely weak aquaculture development and the lack of a clear strategy to transition Indonesian fishermen from capture fisheries to aquaculture. Vietnam's export advantage is largely rooted in the same issue—the weakness of Indonesia's aquaculture system. The limited domestic lobster cultivation facilities in Indonesia have resulted in ineffective regulatory implementation. Consequently, the lobster seed export ban, despite being well-intentioned, has not succeeded in consistently boosting Indonesia's lobster exports.

REFERENCES

- Anisah, L.** (2024). KKP Signals Reopening of Lobster Seed Export Channel to Vietnam. Kontan. asional.kontan.co.id/news/kkp-beri-sinyal-buka-lagi-keran-ekspor-benih-lobster-lagi-ke-vietnam
- Faruqi, H. and Ervani, E.** (2024). Competitiveness Analysis and Factors Influencing Indonesia's Lobster Exports to Major Destination Countries from 2012 to 2022. Musytari, 7(9). <https://ejournal.warunayama.org/index.php/musytarineraca/article/view/5267/4871>
- Gea, S.; Widayatsari, A. and Darmayuda, D.** (2023). Competitiveness Analysis and the Impact of Government Policy on Indonesia's Lobster Exports to Major Destination Countries. JEPP Jurnal Ekonom Pembangunan Dan Pariwisata, Fakultas Ekonomi Dan Bisnis Universitas Palangka Raya, 1–12. <https://e-journal.upr.ac.id/index.php/jeppupr>
- Ilmiah, R. D. and Oktora, S. I.** (2021). ARIMA Intervention Model for Measuring the Impact of the Lobster Seeds Fishing and Export Ban Policy on the Indonesian Lobster Export. Journal of Physics: Conference Series, 2123(1). <https://doi.org/10.1088/1742-6596/2123/1/012011>
- Kameliaaisya, L.; Koeshendrajana, S. and Iqbal, I.** (2005). Competitiveness Analysis of Indonesia's Fishery Product Exports: Using the Revealed Comparative Advantage (RCA) Model and the Constant Market Share Analysis (CMSA) Model. Jurnal Penelitian Perikanan Indonesia, 11.
- KKP.** (2023a). Export Value of Fishery Products by Commodity. KKP2 Statistics. <https://statistik.kkp.go.id/home.php?m=eksim&i=211>
- KKP.** (2023b). Export Value of Fishery Products by Commodity. KKP2 Statistics. <https://statistik.kkp.go.id/home.php?m=eksim&i=211>

- KKP.** (2024). Marine and Fisheries in Figures 2024. https://statistik.kkp.go.id/mobile/asset/book/Buku_KPDA_2024_050724_FINAL_FIX_FP_SP.pdf
- Kyaw AY, J. J.** (2022). Analysis of Policy Has Been Established by The Minister on Opening The Export of Lobster Seed in Indonesia. *Marit Park J Marit Technol Soc*, 19(1), 99–103.
- Lestari, S. N; Junaidi, A.; Suparno, S. and Damanhuri, H.** (2023). Analisis Pola Pemasaran Lobster Yang Diperdagangkan Di Kota Padang Provinsi Sumatera Barat. *Aquacoastmarine: Journal of Aquatic and Fisheries Sciences*, 2(1), 26–33. <https://talenta.usu.ac.id/aquacoastmarine/article/view/11270/6009>
- Ministry of Trade.** (2024). Non-Oil and Gas Export Trends (Destination Countries).
- Pemprov Kalimantan Timur. (n.d.).** Study on Mapping the Potential of Lobster in East Kalimantan. DPMPTSP East Kalimantan Province. <https://dpmptsp.kaltimprov.go.id/storage/download/c485a882d942caf6ff1ed54be6e1e122.pdf>
- Rahayu, I.; Herawati, T.; Nurhayati, A.; MS, Y.; HS, A. A. and Sunarto, S.** (2023). Social and Economic Conditions of Fishermen Catching Lobsters in The Pangandaran Coastal Area, West Java Province. *Acta Aquatica: Aquatic Sciences Journal*, 10(2), 153–157. <https://doi.org/10.29103/aa.v10i2.10655>
- Revindo, M. D. and Devianto, S. E.** (2019). Trade and Industry Brief; Seri Analisis Ekonomi. LPEM FEB UI. www.lpem.org
- Rossa, S.; Gratiana, S.; Rahmawati, S. and Aprilianto Thomas, T.** (2021). Market Failures Behind the Export of Lobster Seeds in Indonesia. *Jurnal POLGOV*, 3(1), 1–39. <https://doi.org/10.22146/polgov.v3i1.2195>
- Sari, HP. and Djumena E.** (2024). KKP Plans to Reopen the Lobster Seed Export Channel. Kompas.Com. <https://money.kompas.com/read/2024/01/11/104300726/kkp-berencana-buka-keran-ekspor-benih-lobster>
- Saria, M.** (2022). Implementation of the Lobster Seed Export Ban Policy in Accordance with Ministerial Regulation No. 17 of 2021 at Popoh Beach, Besuki Subdistrict, Tulungagung Regency. *JFMR-Journal Fish Mar Res*, 6(3).
- Siggel, E.** (2006). International competitiveness and comparative advantage: A survey and a proposal for measurement. *Journal of Industry, Competition and Trade*, 6(2), 137–159. <https://doi.org/10.1007/s10842-006-8430-x>
- Soumya, P. and Yeledhalli, R. A.** (2021). Indonesian Agricultural Exports: Trends and Competitiveness Analysis of Last 2 Decades. *Journal of Experimental Agriculture International*, 3, 82–89. <https://doi.org/10.9734/jeai/2021/v43i330659>

Tirtadanu, A.; Chodrijah, U.; Kang, B. and Zhang, C. I. (2021). Stock Assessment and Management Implications of Three Lobster Species in Gunungkidul Waters, Indonesia. *Ocean and Coastal Management*, 211. <https://doi.org/10.1016/j.ocecoaman.2021.105780>

Trade Map. (2024a). List of exporters for the selected product. <https://www.trademap.org/>

Trade Map. (2024b). List of importers for the selected product. https://www.trademap.org/Country_SelProduct

UN Comtrade Database. (2024). Trade Data. <https://comtradeplus.un.org/TradeFlow?>

Wahyudi, S. T. and Maipita, I. (2018). Comparative Analysis on The Market Share of Indonesian Export Commoties: Opportunities and Challenges. *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan*, 19(2). <https://doi.org/10.23917/jep.v19i2.5708>