Jurnal Teknologi Perikanan dan Kelautan
Vol. 17 No. 2, May 2026: 197-209
ISSN: 2087-4871
EISSN: 2549-3841
DOI: https://doi.org/10.24319/jtpk.17.197-209

DEVELOPMENT STRATEGY FOR CAPTURE FISHERIES BASED ON BLUE ECONOMY IN TANJUNG JABUNG BARAT DISTRICT, JAMBI, INDONESIA

STRATEGI PENGEMBANGAN PERIKANAN TANGKAP BERBASIS *BLUE ECONOMY* DI KABUPATEN TANJUNG JABUNG BARAT, JAMBI, INDONESIA

Farhan Ramdhani[1*], Muhammad Hariski[1], Yoppie Wulanda[1], Sri Novianti[1], Wulandari[1], Izza Mahdiana Apriliani[2], Anta Maulana Nasution[3]

[1]Department of Fisheries, Faculty of Animal Husbandry, University of Jambi,
Jl. Jambi–Muara Bulian KM 15, Muaro Jambi, Jambi 36361, Indonesia
[2]Department of Fisheries, Faculty of Fisheries and Marine Sciences, Padjadjaran University,
Jl. Raya Bandung Sumedang KM 21, Sumedang, West Java 45363, Indonesia
[3]Center for Political Research, National Research and Innovation Agency,
Jl. Gatot Subroto No. 10, South Jakarta, Jakarta 12710, Indonesia
*Corresponding author: framdhani38@gmail.com

(Received February 13, 2025; Revised September 4, 2025; Accepted April 15, 2026)

ABSTRACT

Tanjung Jabung Barat Regency, Jambi Province, has considerable potential for marine capture fisheries; however, fisheries development still faces several sustainability challenges, including the dominance of traditional fishing technology, limited infrastructure, weak market access, low post-harvest quality control, and increasing pressure on fish resources. These conditions indicate the need for a fisheries development strategy aligned with the Blue Economy concept, which emphasizes economic growth while maintaining the sustainability of marine ecosystems and improving coastal community welfare. This study aims to formulate a data-based capture fisheries development strategy in West Tanjung Jabung Barat Regency using SWOT, TOWS, and QSPM approaches. The research was conducted from April 2024 to February 2025 in the Kuala Tungkal Fisheries Center, West Tanjung Jabung Regency. The results indicate that the major strengths include the potential of the fish resource and government support, while the main weaknesses are the dominance of traditional fishing gear and limited fisheries infrastructure. Significant opportunities include strong domestic and international market demand, whereas threats include destructive fishing practices and global market competition. Twelve alternative strategies were identified. The priority strategy is strengthening fisheries market integration through improved product quality, marketing networks, and institutional support. In addition, fisheries infrastructure improvement and environmentally friendly fishing technology adoption are essential to support Blue Economy-based fisheries management. These strategies are expected to enhance fisheries productivity, improve coastal community welfare, and maintain sustainable fishery resources in West Tanjung Jabung Barat Regency.

Keywords: blue economy, development strategies, QSPM, sustainable fisheries, SWOT

ABSTRAK

Kabupaten Tanjung Jabung Barat, Provinsi Jambi, mempunyai potensi perikanan tangkap laut yang cukup besar; namun, pembangunan perikanan masih menghadapi beberapa tantangan keberlanjutan, antara lain dominasi teknologi penangkapan ikan tradisional, terbatasnya infrastruktur, lemahnya akses pasar, rendahnya kendali mutu pascapanen, dan meningkatnya tekanan terhadap sumber daya ikan. Kondisi tersebut menunjukkan perlunya strategi pembangunan perikanan yang selaras dengan konsep Ekonomi Biru, yang menekankan pada pertumbuhan ekonomi dengan tetap menjaga kelestarian ekosistem laut dan meningkatkan kesejahteraan masyarakat pesisir. Penelitian ini bertujuan untuk merumuskan strategi pengembangan perikanan tangkap di Kabupaten Tanjung Jabung Barat berbasis data dengan menggunakan pendekatan SWOT, TOWS, dan QSPM. Penelitian ini dilaksanakan dari April 2024 hingga Februari 2025 di Pusat Perikanan Kuala Tungkal, Kabupaten Tanjung Jabung Barat. Hasil penelitian menunjukkan bahwa kekuatan utama mencakup potensi sumber daya ikan dan dukungan pemerintah, sedangkan kelemahan utama adalah dominasi alat tangkap tradisional dan terbatasnya infrastruktur perikanan. Peluang yang signifikan mencakup permintaan pasar domestik dan internasional yang kuat, sedangkan ancamannya mencakup praktik penangkapan ikan yang merusak dan persaingan pasar global. Dua belas strategi alternatif diidentifikasi. Strategi prioritasnya adalah memperkuat integrasi pasar perikanan melalui peningkatan kualitas produk, jaringan pemasaran, dan dukungan kelembagaan. Selain itu, perbaikan infrastruktur perikanan dan adopsi teknologi penangkapan ikan yang ramah lingkungan sangat penting untuk mendukung pengelolaan perikanan berbasis Ekonomi Biru. Strategi tersebut diharapkan dapat meningkatkan produktivitas perikanan, meningkatkan kesejahteraan masyarakat pesisir, dan menjaga kelestarian sumber daya perikanan di Kabupaten Tanjung Jabung Barat.

Kata kunci: ekonomi biru, perikanan berkelanjutan, QSPM, strategi pengembangan, SWOT

INTRODUCTION

The utilization of marine resources can be a source of economic growth for coastal areas. This is due to the increasing human dependence on marine resources, particularly in coastal areas, where the sustainability of community growth is highly dependent on the maritime industry (Jouffray *et al.* 2020). Given this importance, the blue economy paradigm is strongly emphasized for application in the management of marine resources and coastal areas. The blue economy is the concept of the sustainable use of marine, coastal, and freshwater resources for economic growth, improving livelihoods, and creating jobs, while maintaining the balance of aquatic ecosystems. In the blue economy era, much economic development is based on coastal and marine industries, including the fisheries sector. Therefore, fisheries development in coastal regions should not only focus on increasing production, but also on improving ecological sustainability, social welfare, and economic resilience in accordance with Blue Economy principles.

Tanjung Jabung Barat Regency is located on the east coast of Jambi Province, which is part of the Republic of Indonesia's Fisheries Management Area (WPPNRI) 711 with a potential fishery resource of 22,166.78 tons/year (Marine Affairs and Fisheries Service of Jambi Province 2024). The 30.90 KM coastline and direct access to the South China Sea waters make this area one of the centers of capture fisheries in the Sumatra region (Jambi Province Regional Regulation Number 20 of 2019). The potential is not only seen from the diversity of fish species, but also from the economic potential that can improve the welfare of coastal communities. It is recorded that over the past 3 years, the number of fishing households in Tanjung Jabung Barat Regency has increased by 29.23% (Marine Affairs and Fisheries Service of West Tanjung Jabung Regency 2023).

Despite its significant potential, the capture fisheries sector in West Tanjung Jabung Regency is classified as a small-scale fishery and faces various serious challenges that can hinder its development, such as the suboptimal use of navigation tools and methods for estimating potential fishing areas by local fishermen (Ramdhani *et al.* 2025a). Kongkeaw *et al.* (2019) also stated that small-scale fishers face challenges in utilizing modern technology, such as GPS and depth gauges, due to limited knowledge and skills. Furthermore, although the overall dimension ratio of fishing boats at the research site is in accordance with standards (Ramdhani *et al.* 2022), small-scale fishers generally experience inefficiencies in boat maintenance costs, ship repairs per year, or acquisition of fishing gear, and crew costs in fisheries management (Sangun *et al.* 2018). Another challenge identified at the research site is the lack of infrastructure support, such as adequate port facilities, refrigerated storage, and broad market access (Regional Government of West Tanjung Jabung Regency 2023). However, increasing access to infrastructure by fishermen can increase production efficiency by utilizing developed port facilities and infrastructure (Kuusela *et al.* 2020). Finally, there is a lack of data-driven capture fisheries development strategies to provide accurate information for fisheries management, even though accurate information is key to the development and successful implementation of effective fisheries management (Bradley *et al.* 2019).

This study aims to formulate a data-based capture fisheries development strategy in West Tanjung Jabung Regency. A comprehensive approach is taken, taking into account regional potential (Nursan *et al.* 2020), fisherman capacity (Zal 2016), fishing technology development (Zhang *et al.* 2024), market accessibility and development (Scheld *et al.* 2024), fisheries processing (Nitsuwat *et al.* 2021), and government support through capture fisheries regulations and policies (Zou *et al.* 2024). This approach is expected to address the main fisheries management problems in West Tanjung Jabung Regency, namely limited fishing technology, weak institutional and market systems, low post-harvest quality, and sustainability threats to fishery resources, through a Blue Economy-based management perspective, so that West Tanjung Jabung Regency can become a model for successful fisheries sector development in coastal areas of Indonesia.

METHODS

Time and location

The research was conducted from April 2024 to February 2025 in the Kuala Tungkal Fisheries Center, West Tanjung Jabung Regency. Geographically, the research location is at 0°53'–1°41' S and 103°23'–104°21' E.

Framework for Fisheries Development Strategy Formulation

The formulation of fisheries development strategies in this study followed a sequential management planning approach. First, the main fisheries problems in West Tanjung Jabung Regency were identified through field observations, stakeholder interviews, and in-depth discussions. Second, conceptual fisheries management objectives were formulated based on the identified problems and Blue Economy principles. Third, internal and external strategic factors influencing fisheries management were analyzed using SWOT analysis. Finally, alternative development strategies were formulated using the TOWS matrix and prioritized using the QSPM approach.

Methods and data analysis

The method used in this study was a survey, with data collected in the form of primary and secondary data. Primary data was obtained through field observations, in-depth discussions, interviews, and questionnaires. Field observations were conducted to directly observe the condition of capture fisheries in West Tanjung Jabung Regency. In-depth discussions were conducted periodically, the first being with the Marine Affairs and Fisheries Service of Jambi Province (4 respondents). Secondly, they were conducted with the Marine Affairs and Fisheries Service of West Tanjung Jabung Regency (2 respondents), and Fisheries Extension Officers from the Ministry of Marine Affairs and Fisheries (1 respondent). Thirdly, they were conducted with the Kuala Tungkal Coastal Fisheries Port (3 respondents). The focus of the discussions included issues related to capture fisheries development in West Tanjung Jabung Regency, including capture fisheries potential, government support, fisheries management policies and supervision, and challenges facing the capture fisheries sector.

Interviews were conducted with 20 fishermen, heads of fish landing warehouses (6 respondents), and 4 fish processors. The interviews were conducted to obtain in-depth information regarding mastery of modern fish catching and processing technology, fish catching and processing capacity, availability of facilities and infrastructure at fish landing and processing sites, fish product market competition, access to capital and markets, and the quality and safety of fishery products. A comprehensive questionnaire was also administered to all respondents. Initially, a draft questionnaire was developed and evaluated by the research team to test its validity and reliability (N'Souvi *et al.* 2025). All information obtained was then weighted using a Likert Scale of 1–4 during the analysis process. The respondent selection technique was carried out by purposive sampling with the criteria that respondents have specific roles and knowledge related to capturing fisheries in West Tanjung Jabung Regency.

Secondary data, including information on various fisheries policies, production figures, fishing households, fishing boats, fishing gear, export data, and other resources, were obtained from the West Tanjung Jabung Regency Fisheries Office, the Jambi Province Marine Affairs and Fisheries Office, and the Jambi Province Fish Quarantine and Quality Control Agency (BKIPM).

The data analysis methods used in this study included SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats), the TOWS (Threats, Opportunities, Weaknesses, Strengths) Matrix for strategy formulation based on SWOT factors, and QSPM (Quantitative Strategic Planning Matrix). SWOT analysis was used to identify internal and external factors affecting fisheries' development in West Tanjung Jabung Regency. The SWOT analysis was based on responses to a questionnaire completed by relevant parties, with each answer on a scale of 1–4. Each question was then weighed and ranked according to its relevance to capturing fisheries in West Tanjung Jabung Regency. After the rating and weight are obtained, the next step is to determine the score value by multiplying the weight and rating values (Nursan and Septiadi 2022).

For each defined concept objective, we ask several questions about existing conditions at the research site that explain what strengths, weaknesses, opportunities, and threats have been identified for use as a strategy. Strengths and weaknesses originate from the internal environment (IFAS), including existing resources from stakeholders, including natural resources, human resources, and infrastructure, as input factors in fisheries development. The external environment (EFAS) is a source of opportunities and threats, including markets, business competition, and political support that cannot be controlled by stakeholders (Wijayanto 2016). A SWOT analysis was also used to formulate a strategy for developing capture fisheries in West Tanjung Jabung Regency (Mustofa *et al.* 2018). Afterward, a strategy was developed using the TOWS matrix (Wibowo *et al.* 2022). Strategic priorities were determined using the QSPM. Several studies that used SWOT, TOWS,

and QSPM analyses in fisheries development strategies include Wijayanto et al. (2019), Kurohman *et al.* (2020), Wijayanto *et al.* (2021), and Muhammad *et al.* (2025).

RESULTS AND DISCUSSION

Condition of capture fisheries based on internal factors (IFAS)

Fisheries production in West Tanjung Jabung Regency is dominated by marine capture fisheries compared to public waters and aquaculture activities. Total marine fisheries production in 2023 reached 22,690.53 tons, followed by aquaculture at 1,132.6 tons and public waters capture at 891.5 tons (BPS Tanjung Jabung Barat Regency 2024). This high marine fisheries production is inseparable from the large number of people who work as fishermen. It was recorded that in the past three years, there has been a continuous increase in the number of fishermen, from 1,130 fishermen to 1,505 fishermen (West Tanjung Jabung Regent Decree Number 269 of 2023). This increase indicates that fishing activities have good prospects in the future as a livelihood for the local community. Furthermore, fishermen in West Tanjung Jabung Regency have been carrying out fishing activities for generations, thus possessing specific skills in carrying out fishing operations. However, the fishing boats used are still dominated by sizes under 10 GT and are included in the small-scale fishing category (Ramdhani *et al.* 2022).

Capture fisheries activities are one of the sectors that the local government has focused on in its development to increase income and community welfare. This is reflected in the local government's efforts to guarantee the availability of fishing facilities and infrastructure, namely in the form of grants for fishing vessels, boat engines, fishing gear, and other supporting equipment to 12 Joint Fishermen's Groups (KUB) with total assistance of IDR 2,343,000,000 (West Tanjung Jabung Regent Decree Number 269 2023). This assistance provides an opportunity to increase fisheries production, where the caught fish are landed at the Kuala Tungkal Coastal Fisheries Port (PPP), and six other warehouses in the local area. Although the number of fish landing sites is sufficient, the facilities owned by both the Kuala Tungkal PPP and the warehouses are still very limited, such as the lack of cold storage and the suboptimal clean water supply. Efforts to increase fishing production are also accompanied by the distribution of fishermen's catches to fisheries processing operators (MSMEs) in West Tanjung Jabung Regency, which totaled 255 units in 2022. However, almost all these MSMEs still use traditional facilities and infrastructure and have not implemented optimal hygiene and sanitation principles (Marine Affairs and Fisheries Service of West Tanjung Jabung Regency 2023). In addition to distribution to processors, fish catches can also be distributed to other nearby areas, such as the Riau Islands, via sea ferry transportation, which is available not far from the fish landing sites.

Along with efforts to increase fishing production, fishing activities must also remain guided by the blue economy concept, while also emphasizing wise fishing management, such as regulating fishing seasons, regulating fishing gear types, establishing fishing quotas, and protecting spawning habitats. As explained by Pauly and Froese (2021), fisheries management refers to the implementation of specific actions and decisions related to how fishery resources are exploited or conserved. This encompasses technical and administrative processes, such as establishing catch limits, regulating fishing gear types, and developing marine protected areas. Therefore, these efforts are undertaken to support the implementation of the blue economy concept and maintain the sustainability of fishing businesses. In addition, although fisheries production at the research location in 2021–2023 increased (Marine Affairs and Fisheries Service of West Tanjung Jabung Regency 2023; Marine Affairs and Fisheries Service of Jambi Province 2024), in general, the level of utilization of fish resources in WPPNRI 711 is almost fully exploited (Decree of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 19 2022).

In planning for the development of the capture fisheries sector, fishermen's access to business capital from banks or other sources remains limited. This condition weakens fishermen's competitiveness in producing quality fishery products due to limited facilities and infrastructure, both for catching and processing the catch. These limitations are caused not only by the small scale of fishing but also by the poorly coordinated institutional system for fishermen. This is evident in the inactivity of several Joint Business Groups (KUB) due to ineffective group management, which hinders optimal group activities. Furthermore, the lack of a catch auction system prevents optimal prices for fishermen and leaves them dependent on the landing location. This situation poses both a weakness and an obstacle to developing the local fisheries sector.

Institutions, however, are crucial for increasing fishermen's productivity and competitiveness. Institutions have two primary functions: normative (as guidelines for behavior) and regulatory (as rules of the game), which act as social control among fishermen (Hernawan *et al.* 2019).

Condition of capture fisheries based on external factors (EFAS)

The increasing number of fishermen over the past three years has not fully benefited the sustainability of fisheries in West Tanjung Jabung Regency. This is due to the continued use of destructive fishing gear, such as trawls. A total of 169 units (11.22%) of trawls is still operating locally (Marine Affairs and Fisheries Service of West Tanjung Jabung Regency 2023). This clearly hurts the sustainability of fisheries resources, particularly in terms of selectivity. Trawls produce 63.35% of non-target fish caught (Ramadan *et al.* 2020). In addition to trawls, several other fishing gears, such as gillnets and fixed bag nets, also have the same issue regarding selectivity, which shows that until now, many non-target fish are still caught in the net, with percentages of 77.68% and 81.4%, respectively (Ramdhani *et al.* 2019; Nofrizal *et al.* 2022). Harrington *et al.* (2005) stated that non-target catches (bycatch) can not only affect fish stocks in a water, but can also affect the food chain and habitat, and damage the ecosystem. Tzanatos *et al.* (2007) added that the factors that make the catch as bycatch are caused by: (1) the low economic value of the catch, (2) the catch is used as bait, and (3) poor handling of the catch.

The high number of non-target catches not only poses a problem for the sustainability of fishery resources but also impacts the price and quality of fishermen's catches. Furthermore, the lack of refrigerated storage facilities at fish landing sites further accelerates the decline in catch quality. This situation should be a concern in efforts to develop the local fisheries sector. In addition to these issues, several other factors pose a potential threat to the sustainability of fisheries in West Tanjung Jabung Regency. These factors include the suboptimal data collection or licensing of fishing vessels, the low capacity of fishermen in utilizing modern fishing technology, and the limited employment in the fisheries processing industry. Furthermore, the increasingly fierce competition in the international fish trade also poses a challenge. This situation can cause fishery commodities from West Tanjung Jabung Regency to be less attractive in the international market, primarily due to incomplete export permit documents and the lack of ports with container ship facilities for direct export.

On the other hand, in terms of demand, the catch, both live and fresh, has high demand from both domestic and international markets. Based on data from the Jambi Province Fish Quarantine and Quality Control Center (2023), it was recorded that in 2022, the fishery products from Jambi Province that had the highest frequency of shipments out of the region were mantis shrimp (*Harpiosquilla raphidea*) with 3,413 shipments, followed by white pomfret (*Pampus argenteus*) with 1,047 shipments, and black pomfret (*Parastromateus niger*) with 557 shipments, where these three commodities are products that have great potential to be developed as export products, especially white pomfret (*Pampus argenteus*) which is one of the superior local fishery commodities (Ramdhani *et al.* 2025b). The potential for development of several commodities requires support from improvements in fishing facilities and infrastructure, such as increasing the gross tonnage (GT) of boats. Currently, only seven vessels exceeding 20 GT (BPS Tanjung Jabung Barat Regency 2024). Furthermore, expanding market access is essential to offset efforts to increase catch production and modernize fish processing equipment to expand the range of high-quality processed fish. Currently, export access is limited to Taiwan, Singapore, Hong Kong, and China (Dahuri 2003; Ramdhani *et al.* 2019; Nofrizal *et al.* 2020).

Local government support, in addition to providing grants related to fishing facilities and infrastructure, also supports processing businesses by providing assistance in the form of 5 packages of fish processing equipment and 1 package of marketing equipment (West Tanjung Jabung Regent Decree Number 269 2023). In addition, in an effort to expand the reach of fishing areas, a map of estimated potential fishing areas in the local area (WPPNRI 711) has been compiled using remote sensing technology and a geographic information system based on satellite imagery data. The data used are oceanographic parameters such as sea surface temperature (SST) and chlorophyll-a abundance. The use of this technology is expected to increase the productivity and efficiency of fishing efforts at the research site (Ramdhani *et al.* 2025a).

Fishing activities should be conducted in line with the principles of the blue economy concept. Therefore, a nationally regulated measured fishing policy has been implemented. The measured fishing policy is implemented through Government Regulation Number 11 of

2023 and Regulation of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 28 of 2023 concerning Measured Fishing. According to Pasaribu *et al.* (2022) and Trenggono (2023), this policy represents the expected outcomes of fisheries management in Indonesia, namely maintaining fish resource sustainability while improving socio-economic benefits for fishing communities and fisheries businesses. The implementation of the measured fishing policy is highly relevant to the current fisheries conditions in West Tanjung Jabung Regency, where several problems still occur, including increasing fishing pressure, the continued use of destructive fishing gear, weak supervision of fishing activities, limited fisheries data collection, and the growing risk of overexploitation in WPPNRI 711. These conditions indicate that fisheries utilization has not been fully aligned with sustainable fisheries management principles. Therefore, the measured fishing policy is expected to improve fisheries governance, strengthen resource control, regulate fishing effort, and support the implementation of Blue Economy-based fisheries development.

The above presentation of IFAS and EFAS considerations is reinforced by observations and in-depth discussions with stakeholders such as the West Tanjung Jabung Regency Marine Affairs and Fisheries Office, the Jambi Province Marine Affairs and Fisheries Office, and the Head of the West Tanjung Jabung Regency Coastal Fishing Port. Based on these findings, key challenges facing capture fisheries activities in 2024 were identified (Table 1).

Development strategy for the capture fisheries sector in West Tanjung Jabung Regency

The preparation of a strategy for developing the capture fisheries sector is based on the problems in the capture fisheries sector that occur in West Tanjung Jabung Regency and is carried out by considering strengths, weaknesses, opportunities, and threats. The formulation of strategies for strengths and weaknesses (internal), along with the results of the analysis, can be seen in Table 2.

Based on Table 2, it is known that the total strength score is 3.12 and the total weakness score is 2.80. This indicates that the strength factor has a greater role in the development strategy of the capture fisheries sector in West Tanjung Jabung Regency. Next, the total strength score will be subtracted from the total weakness score to obtain the X-axis value that will be used to determine the location of the internal factor points in the TOWS matrix quadrant, where the X-axis value is 0.32. The preparation of the opportunity and threat (external) strategy, along with the analysis results, can be seen in Table 3.

Table 3 shows that the total threat score is 2.64 and the total opportunity score is 3.17. This indicates that the opportunity factor plays a greater role in the development strategy of the capture fisheries sector in West Tanjung Jabung Regency. The total opportunity score will then be subtracted from the total threat score to obtain the Y-axis value, which will be used to determine the location of external factor points within the TOWS matrix quadrant, where the Y-axis value is 0.53.

Determination of the development strategy for the capture fisheries sector in West Tanjung Jabung Regency

Based on the calculation results of the internal and external strategic factor matrices, it can be seen that the difference in the internal strategic factor matrix score is 0.32, where the value is on the positive X-axis, which means that the strength factor plays a greater role than the weakness factor. The difference in the external strategic factor matrix score is 0.53, where the value is on the positive Y-axis, which means that the opportunity factor plays a greater role than the threat factor. The X and Y-axis values are then entered into the TOWS matrix quadrant. The results show that the meeting point of the two axes is in quadrant I, namely the growth orientation quadrant, which is a prime condition where the fisheries sector has large internal strengths to take maximum advantage of external opportunities (Figure 1).

Based on the TOWS matrix quadrants in Figure 1, the strategic position for developing the capture fisheries sector in West Tanjung Jabung Regency is in Quadrant I, the growth orientation quadrant. These places locally capture fisheries resources in a highly advantageous position, with annual capture fisheries production reaching 22,690.53 tons. This presents a significant opportunity to advance capture fisheries in West Tanjung Jabung Regency through the export of fresh and processed products. Therefore, strengths and opportunities outweigh weaknesses and threats.

Table 1. Problems in capture fisheries activities in West Tanjung Jabung Regency in 2024, based on the results of observations and in-depth discussions.

No	Problems	Description
1	Limited technology and production capacity	The use of traditional fishing gear and small-scale boats limits productivity and efficiency.
2	Human resource quality	The quality of human resources in fishermen's knowledge, skills in modern technology, and business management is suboptimal.
3	Access to capital and markets	Fishermen face difficulties in accessing business capital and broad markets, both domestically and internationally.
4	Catch quality and safety	The low quality of the catch is due to the use of destructive fishing gear and inadequate post-harvest handling facilities.
5	Level of fish resource utilization	Massive fishing and the use of destructive fishing gear threaten the sustainability of fish resources.
6	Law enforcement	Lack of supervision and law enforcement regarding fishing activities.
7	Global competition	High competition in the international market makes it difficult for local fishery products to compete.

Table 2. Results of the analysis of strategic internal factors in the development of the capture fisheries sector in West Tanjung Jabung Regency.

No	Internal Factors	Weight	Rating	Score
	Strength			
S1	Potential fish resources in West Tanjung Jabung Regency	0.17	2.92	0.50
S2	Many fishermen work in West Tanjung Jabung.	0.16	3.50	0.55
S3	Fishermen are highly experienced in fishing at sea.	0.16	3.12	0.51
S4	Fishermen have developed many processed fisheries products, and fish processing units exist.	0.14	3.00	0.43
S5	The government has provided significant assistance to fishermen and is focused on increasing the added value of the fisheries sector.	0.14	3.30	0.48
S6	There is a Coastal Fishing Port (CFP), or fish landing site, that securely accommodates all catches.	0.11	2.79	0.32
S7	There is a public port/ferry for inter-island sea transportation.	0.11	3.00	0.33
	Strength Total	**1.00**		**3.12**
	Weakness			
W1	Fishing boats and gear are predominantly small-scale (<10 GT), and fishing technology remains traditional.	0.15	3.25	0.49
W2	Production facilities and other infrastructure (other than fish landing sites) are still limited in West Tanjung Jabung Regency.	0.17	2.75	0.47
W3	Competitiveness, productivity, human resource quality, and institutional capacity among fishermen remain weak.	0.13	2.79	0.35
W4	Access to banking capital and market share remains limited.	0.12	2.58	0.32
W5	Processed fish production still uses traditional equipment, which impacts the quantity and quality of processed products.	0.15	2.71	0.41
W6	Processing facilities (PF) and storage facilities are still traditional and do not optimally implement hygiene and sanitation principles.	0.15	2.92	0.43
W7	Utilization status in WPPNRI 711 is approaching full exploitation.	0.13	2.54	0.33
	Weakness Total	**1.00**		**2.80**
	X axis (Strength total – Weakness total)			**0.32**

Table 3. Results of the analysis of strategic external factors in the development of the capture fisheries sector in West Tanjung Jabung Regency.

No	External Factors	Weight	Rating	Score
	Threats			
T1	The presence of destructive fishing gear	0.14	2.33	0.33
T2	Lack of optimal oversight of the selectivity of the catch from the use of fishing gear	0.15	2.58	0.38
T3	Low fish prices and poor fish quality (domestic and export) due to inadequate storage facilities	0.16	2.58	0.42
T4	Lack of optimal data collection or licensing of fishing boats, and the distribution of fishing areas	0.14	2.29	0.33
T5	Extreme weather conditions and large waves prevent fishermen from going to sea	0.14	3.16	0.46
T6	Labor absorption in the fishing industry tends to be low	0.14	2.75	0.38
T7	The international fish trade competition is high	0.13	2.79	0.36
	Threats Total	**1.00**		**2.64**
	Opportunities			
O1	Demand for fishery products, both fresh and processed, is high.	0.17	3.33	0.58
O2	Efforts to increase vessel size (GT), increase fishing gear, and fishing aids.	0.16	2.96	0.46
O3	Providing processed products with high sales value and open market access.	0.16	3.41	0.55
O4	The government is supporting the development of fishing and processing businesses.	0.15	3.54	0.53
O5	Fishery technology is increasingly sophisticated worldwide, and information technology is advancing rapidly.	0.13	3.04	0.38
O6	The concept of measured fishing and stronger enforcement of illegal fishing laws by the central government are being implemented.	0.12	2.83	0.34
O7	Political and regulatory support for fisheries development is increasing.	0.11	2.875	0.33
	Opportunities Total	**1.00**		**2.80**
	Y axis (Threats total – Opportunities total)			**0.32**

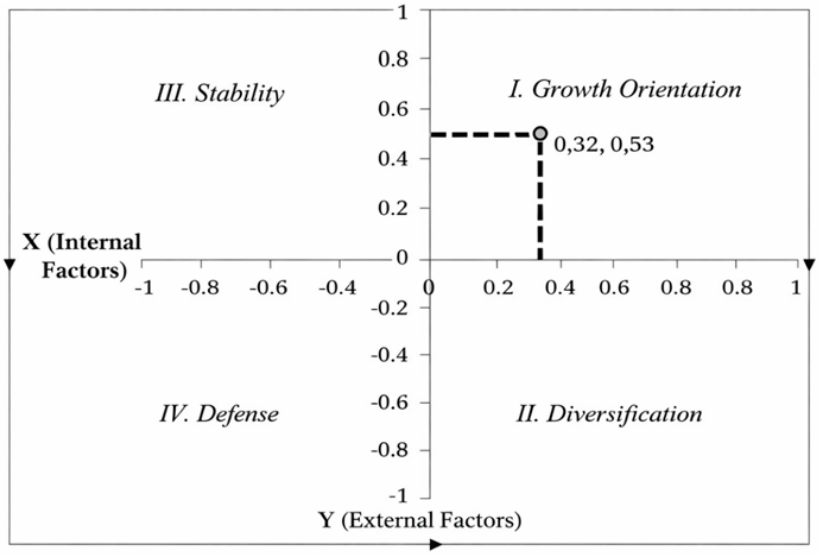

Figure 1. TOWS matrix quadrants for determining capture fisheries development strategies.

Table 4. Analysis of the QSPM approach to determine the priority order of the capture fisheries sector development strategy in West Tanjung Jabung Regency.

Order	Capture Fisheries Development Strategy	TAS
1	Increasing fishermen's access to wider markets, both domestic and international. This strategy can be implemented by building a strong marketing network and improving product quality. (SO3) (S1, S2, S5, S7, O1, O3, O4, O5)	4.23
2	Improving fishing port infrastructure and fish processing facilities. This strategy can improve product quality and reduce post-fishing losses. (WO3) (W2, W3, W6, W7, O1, O2, O3, O4)	4.17
3	Reducing reliance on traditional (unenvironmentally friendly) fishing gear by adopting more modern (more environmentally friendly) and efficient fishing technologies. This strategy can increase productivity and reduce negative impacts on the environment. (WT1) (W1, W2, W5, W6, T1, T4, T6, T7)	3.89
4	Implement sustainable fishing practices to maintain the sustainability of fish resources. This strategy can be implemented by monitoring the use of destructive fishing gear and implementing managed fishing zones. (ST1) (S2, S3, S5, S6, T1, T3, T4, T6)	3.75
5	Improve the quality of human resources among fishermen through training and education. This strategy can increase their productivity and competitiveness. (WO1) (W1, W3, W5, W6, O2, O3, O5, O7)	3.46
6	Utilize the potential of fish resources by increasing fishing capacity. This strategy can be implemented by providing assistance to fishermen to increase boat size and use more modern fishing technology. (SO1) (S1, S5, S6, O1, O2, O4, O6)	3.32
7	Provide social protection to fishermen affected by climate change and fluctuating fish prices. This strategy can improve fishermen's welfare and maintain social stability. (WT3) (W2, W3, W4, W7, T3, T5, T6)	3.18
8	Increase oversight of illegal fishing activities. This strategy can be implemented by increasing maritime patrols and strengthening cooperation with law enforcement officials. (ST2) (S1, S2, S3, S6, T2, T5)	2.80
9	Build high-quality local fishery product brands to face international competition. This strategy can increase the competitiveness of Indonesian fishery products in the global market. (ST3) (S1, S4, S5, S7, T6, T7)	2.66
10	Develop processed fishery products by utilizing the expertise of local fishermen and supported by modern technology. This strategy can increase the added value of fishery products and expand the market. (SO2) (S3, S4, O3, O5, O7)	2.38
11	Increase fishermen's access to business capital through collaboration with financial institutions. This strategy can support the development of fishery businesses. (WO2) (W4, O1, O4, O6)	1.91
12	Increase government capacity in monitoring and controlling fishing activities. This strategy can prevent illegal fishing and preserve fish resources. (WT2) (W1, T2, T4)	1.38

The strategy developed involves using strengths to capitalize on existing opportunities. This aligns with the opinions of Kurniawati *et al.* (2022) and Rini *et al.* (2017), who state that a strategy in Quadrant I is highly advantageous because it encompasses both strengths and opportunities, leveraging all existing strengths to maximize opportunities to increase capture fisheries production. According to Kusumawati *et al.* (2023), Quadrant I is a very favorable situation, where the fisheries activity has opportunities and strengths, so that it can take advantage of existing opportunities, and the strategy implemented in this condition is to support an aggressive growth policy (growth-oriented strategy).

Formulation of a strategy for developing the capture fisheries sector in West Tanjung Jabung Regency

The development strategy for the capture fisheries sector in West Tanjung Jabung Regency was formulated using a combination of the TOWS matrix. Based on the results of the SWOT analysis, a combination of several strategies was generated, including SO, WO, ST, and WT strategies (Pasaribu *et al.* 2025). Each SO, WO, ST, and WT strategy has three strategic options that can be considered for the development of the capture fisheries sector, resulting in 12 strategies. The strategies were then compiled into a TOWS matrix, adjusted

to the IFAS and EFAS factors. The results of the SO, WO, ST, and WT combination analysis provided a ranking in the form of a Total Alternative Strategy (TAS) value using the QSPM approach (Table 4).

The results of the QSPM analysis indicate that the fisheries sector development strategies that need to be prioritized as development strategies in sequence from largest to smallest are SO3, WO3, WT1, ST1, WO1, SO1, WT3, ST2, ST3, SO2, WO2, and WT2. The strategy with the highest attractiveness score is related to increasing fishermen's access to wider markets, both domestic and international. This strategy is based on current conditions, where sales to domestic and international markets cannot be realized optimally, including access to business permits and meeting product quality standards requested, especially by the international market. What can be done is to optimize the provision/access to business permits for export and provide facilities to adjust product quality standards, so that market access both domestically and internationally can be carried out directly by business actors in West Tanjung Jabung Regency. This strategy must be accompanied by building a strong marketing network by consistently improving product quality. Taking SO strategy actions refers to the opinion of Sahubawa *et al.* (2021), who stated that the SO strategy can be implemented by optimally utilizing the potential of fish resources and adequate fishing technology to meet domestic and foreign market demand.

CONCLUSION

Capture fisheries development in West Tanjung Jabung Regency faces several major problems, including limited fishing technology, inadequate fisheries infrastructure, weak institutional and market access, low post-harvest quality, and increasing pressure on fishery resources. These problems indicate the need for fisheries development strategies that support both economic growth and resource sustainability under the Blue Economy framework. This study formulated several conceptual objectives, including improving fishing efficiency, strengthening institutional and human resource capacity, increasing product quality and market access, and maintaining sustainable fishery resource utilization in WPPNRI 711. Based on SWOT, TOWS, and QSPM analyses, twelve development strategies were identified. The priority strategy is strengthening fisheries market integration through improved product quality, marketing networks, institutional support, and better access to domestic and international markets. Other important strategies include improving fisheries infrastructure, promoting environmentally friendly fishing technology, strengthening fisheries supervision, and enhancing fishermen's capacity. These strategies are expected to improve fisheries competitiveness, coastal community welfare, and sustainable fisheries governance in West Tanjung Jabung Regency.

ACKNOWLEDGEMENTS

We would like to express our gratitude to the Fisheries Service of West Tanjung Jabung Regency, the Marine Affairs and Fisheries Service of Jambi Province, and the Fish Quarantine and Quality Control Agency for their cooperation in providing research data. We also extend our gratitude to the fishermen, fisheries processors, the head of the TPI warehouse, and the Kuala Tungkal Fisheries Management Unit (PPP), who always assisted us in the data collection process from the beginning to the end of the research. We also thank the Faculty of Animal Husbandry for funding this research through the Institute for Research and Community Service (LPPM) of Jambi University with the grant number SP DIPA-023.17.2.677565/2024 in 2024.

REFERENCES

[BPS] Badan Pusat Statistik Kabupaten Tanjung Jabung Barat. 2024. Kabupaten Tanjung Jabung Barat dalam Angka 2024. Tanjung Jabung Barat.

Bradley D, Merrifield M, Miller KM, Lomonico S, Wilson JR, Gleason MG. 2019. Opportunities to Improve Fisheries Management Through Innovative Technology and Advanced Data Systems. *Fish and Fisheries*. 20(3): 564–583. DOI: https://doi.org/10.1111/faf.12361.

Dahuri R. 2003. *Keanekaragaman Hayati Laut: Aset Pembangunan Berkelanjutan Indonesia*. Jakarta (ID): PT Gramedia Pustaka Utama.

Decree of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 19 of 2022 concerning the Estimation of Fish Resource Potential, Allowable Fish Catch Amount, and Level of Fish Resource Utilization in the Fisheries Management Area of the

Republic of Indonesia. Jakarta.
Government Regulation Number 11 of 2023 concerning Measured Fishing. Jakarta.
Harrington JM, Myers RA, Rosenberg AA. 2005. Wasted Fishery Resources: Discarded By-Catch in the USA. *Fish and Fisheries*. 6(4): 350–361. DOI: https://doi.org/10.1111/j.1467-2979.2005.00201.x.
Hernawan D, Rahmawati R, Seran GG, Luthfie M. 2019. Peningkatan Kapasitas Kelembagaan Nelayan untuk Adaptasi terhadap Perubahan Iklim. *Jurnal Mina Sains*. 5(1): 13–23. DOI: https://doi.org/10.30997/jms.v5i1.1769.
Jambi Province Fish Quarantine and Quality Control Center. 2023. Export Commodity Traffic Data of Jambi Province 2022. Jambi.
Jambi Province Regional Regulation Number 20 of 2019. Coastal Area and Small Islands Zoning Plan of Jambi Province 2019-2039. Jambi.
Jouffray JB, Blasiak R, Norström AV, Österblom H, Nyström M. 2020. The Blue Acceleration: The Trajectory of Human Expansion into the Ocean. *One Earth*. 2(1): 43–54. DOI: https://doi.org/10.1016/j.oneear.2019.12.016.
Kongkeaw C, Kittitornkool J, Vandergeest P, Kittiwatanawong K. 2019. Explaining Success in Community based Mangrove Management: Four Coastal Communities along the Andaman Sea, Thailand. *Ocean & Coastal Management*. 178: 104822. DOI: https://doi.org/10.1016/j.ocecoaman.2019.104822.
Kurniawati R, Aulawi H, Rismawati S. 2022. Analisis Strategi Pengembangan Bisnis dengan Metode *Business Model Canvas* (BMC) dan *Quantitative Strategic Planning Matrix* (QSPM). Jurnal Kalibrasi. 20(2): 93–101. DOI: https://doi.org/10.33364/kalibrasi/v.20-2.1152.
Kurohman F, Wijayanto D, Budi Jayanto B. 2020. The Strategy of Capture Fisheries Development in Pamekasan Regency, Madura Island. *Aquaculture, Aquarium, Conservation & Legislation - International Journal of the Bioflux Society* (*AACL Bioflux*). 13(5): 2816–2817.
Kusumawati L, Sudianto A, Suharyanto S. 2023. Analysis of Priority Locations for The Development of Fishery Ports in the Southern of Java Island. *Akuatikisle Jurnal Akuakultur Pesisir dan Pulau-Pulau Kecil*. 7(1): 67–76. DOI: https://doi.org/10.29239/j.akuatikisle.7.1.67-76.
Kuusela OP, Bowman MS, Amacher GS. 2020. Does Infrastructure and Resource Access Matter for Technical Efficiency? An Empirical Analysis of Fishing and Fuelwood Collection in Mozambique. *Environment, Development and Sustainability*. 22: 1811–1837. DOI: https://doi.org/10.1007/s10668-018-0264-2.
Marine Affairs and Fisheries Service of Jambi Province. 2024. Recapitulation of Marine Fisheries Production Results from Ports and Non-Ports in Jambi Province. Jambi.
Marine Affairs and Fisheries Service of West Tanjung Jabung Regency. 2023. Recapitulation of Marine Fisheries Production Results of Tanjung Jabung Barat Regency. Tanjung Jabung Barat.
Muhammad, Hastuti YP, Nurmawati S. 2025. Development Strategy of Seaweed (*Kappaphycus alvarezii*) Cultivation Business in the Waters of Pantai Amal of Tarakan City. *Jurnal Teknologi Perikanan dan Kelautan*. 16(1): 63–76. DOI: https://doi.org/10.24319/jtpk.16.63-76.
Mustofa NR, Mudzakir AK, Kurohman F. 2018. Pengembangan Berbasis Komoditas Unggulan Perikanan Tangkap di Kabupaten Pekalongan. *Journal of Fisheries Resources Utilization Management and Technology*. 7(2): 68–77.
Nitsuwat S, Zhang P, Ng K, Fang Z. 2021. Fish Gelatin as an Alternative to Mammalian Gelatin for Food Industry: A Meta-Analysis. *LWT - Food Science and Technology*. 141: 110899. DOI: https://doi.org/10.1016/j.lwt.2021.110899.
Nofrizal N, Mauliddin M, Jhonnerie R, Bustari B, Fatmawati R. 2022. Modification of Togok (Tidal Trap) for Reducing Bycatch by Using BRD Vent. *Depik Jurnal Ilmu-Ilmu Perairan, Pesisir dan Perikanan*. 11(3): 275–281. DOI: https://doi.org/10.13170/depik.11.3.26067.
Nofrizal N, Ramdhani F, Jhonnerie R. 2020. Financial Value and Potential Conflict of Mantis Shrimp in Kuala Tungkal, Jambi. *Jurnal Ilmu dan Teknologi Kelautan Tropis*. 12(1): 25–36. DOI: http://doi.org/10.29244/jitkt.v12i1.27223.
N'Souvi K, Sun C, Rivero YMR. 2025. Development of Marine Small-Scale Fisheries in Togo: An Examination of The Efficiency of Fishermen at The

New Fishing Port of Lomé and The Necessity of Fisheries Co-Management. *Aquaculture and Fisheries*. 10(2): 344–353. DOI: https://doi.org/10.1016/j.aaf.2023.07.009.

Nursan M, Septiadi D. 2022. Strategi Pengembangan Perikanan Tangkap di Kabupaten Sumbawa Barat. *Jurnal Bisnis Tani*. 7(2): 54–66. DOI: https://doi.org/10.35308/jbt.v7i2.4200.

Nursan M, Nabilah S, Sari NW. 2020. Potensi dan Strategi Pengembangan Kawasan Minapolitan Kertasari Kabupaten Sumbawa Barat. *Jurnal Ilmiah Membangun Desa dan Pertanian* (*JIMDP*). 5(6): 192–201. DOI: http://dx.doi.org/10.37149/JIMDP.v5i6.14605.

Pasaribu IF, Hapsari TD, Wibowo BA. 2022. Analisis Pemasaran Ikan Tongkol (*Euthynnus affinis*) di Pangkalan Pendaratan Ikan Kranji, Kabupaten Lamongan. *Buletin Ilmiah Marina Sosial Ekonomi Kelautan dan Perikanan*. 8(2): 103–115. DOI: https://doi.org/10.15578/marina.v8i2.11043.

Pasaribu IF, Hapsari TD, Prasetya GY. 2025. Strategy for Developing Blue Economic Potential Through Sustainable Tourism in the Coastal Area of Semarang City. *Jurnal Teknologi Perikanan dan Kelautan*. 16(2): 173-188. DOI: https://doi.org/10.24319/jtpk.16.173-188.

Pauly D, Froese R. 2021. MSY Needs No Epitaph—but It Was Abused. *ICES Journal of Marine Science*. 78(6): 2204–2210. DOI: https://doi.org/10.1093/icesjms/fsaa224.

Ramadan F, Ramdhani F, Efizon D, Nofrizal. 2020. Ancaman Keanekaragaman Hayati (*Biodiversity*) terhadap Ekosistem Daerah Penangkapan Pukat Hela. *Dinamika Lingkungan Indonesia*. 7(2): 129–136. DOI: https://doi.org/10.31258/dli.7.2.p.129-136.

Ramdhani F, Heltria S, Magwa RJ, Ramadan F, Nofrizal N, Jhonnerie R. 2022. Karakteristik Dimensi Utama Kapal Gillnet (*Static Gear*) pada Penangkapan Udang Mantis (*Harpiosquilla raphidea*) di Kampung Nelayan, Jambi. *Akuatika Indonesia*. 7(2): 80–86. DOI: https://doi.org/10.24198/jaki.v7i2.43530.

Ramdhani F, Heltria S, Suryono, Hariski M, Yunita LH, Novianti S, Wulanda Y, Wulandari, Gelis ERE. 2025a. Mapping Potential Fishing Ground in Kuala Tungkal, Tanjung Jabung Barat, Jambi Province. *ABDIMAS: Jurnal Pengabdian Masyarakat UMTAS*. 8(1): 136–144. DOI: https://doi.org/10.35568/abdimas.v8i1.5593.

Ramdhani F, Hariski M, Wulanda Y, Heltria S, Wulandari, Gelis ERE, Novianti S. 2025b. Integrative Approach: Production, Development, and Specialization Index of Capture Fisheries to Determine Leading Commodities in Tanjung Jabung Barat Regency, Indonesia. *Egyptian Journal of Aquatic Biology & Fisheries*. 29(4): 2069–2085. DOI: https://doi.org/10.21608/ejabf.2025.445335.

Ramdhani F, Nofrizal, Jhonnerie R. 2019. Studi Hasil Tangkapan *Bycatch* dan *Discard* pada Perikanan Udang Mantis (*Harpiosquilla raphidea*) Menggunakan Alat Tangkap Gillnet. *Marine Fisheries*. 10(2): 129–139. DOI: https://doi.org/10.29244/jmf.v10i2.29496.

Regulation of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 28 of 2023 concerning Implementing Regulations of Government Regulation Number 11 of 2023 concerning Measured Fishing. Jakarta.

Regional Government of West Tanjung Jabung Regency. 2023. Study on Increasing Added Value in the Fisheries Sector in West Tanjung Jabung Regency in 2023. Jambi.

Rini NP, Hapsari TD, Sardiyatmo S. 2017. Kelayakan Finansial Unit Usaha Penangkapan *Multigear* (Jaring Rampus dan Jaring Udang) di Pelabuhan Perikanan Pantai Tawang Kabupaten Kendal. *Saintek Perikanan: Indonesian Journal of Fisheries Science and Technology*. 12(2): 123–133. DOI: https://doi.org/10.14710/ijfst.12.2.124-133.

Sahubawa L, Atmoko CR, Sasongko SMA. 2021. Application of Technology to Increase Economic Value and Consumer Preferences of Tilapia, Stingray and Cow Leather Products. *4th International Symposium on Marine and Fisheries Research, 28–29 July 2021, Yogyakarta, Indonesia*. IOP Conference Series: Earth and Environmental Science. DOI: https://doi.org/10.1088/1755-1315/919/1/012032.

Sangun L, Guney OIAN, Berk A. 2018. Economic Efficiency Performance of Small-Scale Fisheries in The East Mediterranean Coast of Turkey. N*ew Medicine*. 17. DOI: https://doi.org/10.30682/nm1804f.

Scheld AM, Calhoun WR, Gilsinan CB, White SB. 2024. Market Development for An Invasive Fish Species: Blue Catfish in the Chesapeake Bay, US. *Fisheries Research*. 278: 107099. DOI: https://doi.org/10.1016/j.fishres.2024.107099.

Trenggono SW. 2023. Penangkapan Ikan Terukur Berbasis Kuota untuk Keberlanjutan Sumber Daya Perikanan di Indonesia. *Jurnal Kelautan dan Perikanan Terapan* (*JKPT*). 1: 1–8. DOI: https://doi.org/10.15578/jkpt.v1i0.12057.

Tzanatos E, Somarakis S, Tserpes G, Koutsikopoulos C. 2007. Discarding Practices in a Mediterranean Small-scale Fishing Fleet (Patraikos Gulf, Greece). *Fisheries Management and Ecology*. 14(4): 277–285. DOI: https://doi.org/10.1111/j.1365-2400.2007.00556.x.

West Tanjung Jabung Regent Decree Number 269 of 2023 concerning the Recipients of Grant Assistance from the Fisheries Office of West Tanjung Jabung Regency for the Year 2023. West Tanjung Jabung.

Wibowo BA, Wijayanto D, Setiyanto I, Dewi DA. 2022. Important Performance Analysis of Capture Fisheries Development in Karimunjawa Islands. *Aquaculture, Aquarium, Conservation & Legislation - International Journal of the Bioflux Society* (*AACL Bioflux*). 15(5): 2396–2404.

Wijayanto D. 2016. Fisheries Development Strategies of Biak Numfor Regency, Indonesia. *Aquatic Procedia*. 7: 28–38. DOI: https://doi.org/10.1016/j.aqpro.2016.07.004.

Wijayanto D, Setiyanto I, Setyawan HA. 2019. Financial Analysis of the Danish Seine Fisheries Business in Rembang Regency, Indonesia. *Aquaculture, Aquarium, Conservation & Legislation - International Journal of the Bioflux Society* (*AACL Bioflux*). 12(5): 1823–1831.

Wijayanto D, Wibowo BA, Setiyanto I. 2021. The Strategy of Capture Fisheries Development in Rembang Regency. *Aquaculture, Aquarium, Conservation & Legislation - International Journal of the Bioflux Society* (*AACL Bioflux*). 14(3): 1786–1800.

Zal WA. 2016. Fragility and Capacity Building of Social Capital of Malaysian Fishermen. *Ocean & Coastal Management*. 119: 177–183. DOI: https://doi.org/10.1016/j.ocecoaman.2015.10.009.

Zhang Y, Wang X, Sun L, Lei P, Chen J, He J, Zhou Y, Liu Y. 2024. Mask-guided Deep Learning Fishing Net Detection and Recognition Based on Underwater Range Gated Laser Imaging. *Optics & Laser Technology*. 171: 110402. DOI: https://doi.org/10.1016/j.optlastec.2023.110402.

Zou J, Jin X, Shan X, Ren Y, Chen Y. 2024. Whether The Summer Fishing Moratorium Can Improve the Status of Fisheries Resources in the Yellow Sea and Bohai Sea. *Heliyon*. 10(19): e38100. DOI: https://doi.org/10.1016/j.heliyon.2024.e38100.