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Strengthening Fisheries MSMEs for Economic Growth in Mamberamo Hilir District, Mamberamo Raya Regency

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ABSTRACT

Purpose: This study analyzes the internal and external conditions affecting fisheries micro, small, and medium enterprises in Mamberamo Hilir District and formulates development strategies using Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis.
Methodology: A descriptive qualitative case study design was applied, drawing on in-depth interviews, field observation, and documentation with twenty informants comprising local officials, fishers, fish traders, and consumers, analyzed through a four-stage qualitative SWOT procedure covering factor identification, narrative interpretation, relational mapping, and strategy formulation.
Result: The district possesses strong fisheries potential supported by strategic coastal resources and fishing experience, but development is constrained by limited infrastructure, capital, and marketing, despite opportunities from digital technology, market demand, and government support.
Conclusions: Fisheries enterprises meaningfully sustain fishing households and generate a measurable local multiplier effect, though this contribution remains below its potential.
Limitations: The case study and purposive sample limit generalizability. The study provides a locally grounded framework integrating SWOT analysis with Local Economic Development indicators.
Contributions: The study proposes a locally grounded strategy framework linking SWOT to Local Economic Development indicators for an eastern Indonesian fishing community.

Keywords: *Development Strategy, Fisheries MSMEs, Local Economic Growth, Mamberamo Hilir, SWOT Analysis*

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1. Introduction

Regional development constitutes an integral part of national development, as mandated by Article 258, Paragraph 2 of Law Number 23 of 2014 concerning Regional Government, which affirms that regional development is the implementation of governmental affairs delegated to local governments in order to achieve the goals of the state. This process aims to realize a prosperous, equitable, and

just society while stimulating the growth of economic life, self-esteem, self-confidence, creativity, and social solidarity that functions in a socially meaningful way (Undang-Undang, 2014).

National economic development does not rest solely on large-scale industry and foreign investment but is substantially supported by the existence of micro, small, and medium enterprises. These enterprises constitute an important pillar of the Indonesian economy because they play a strategic role in creating employment, raising community income, and accelerating the equitable distribution of national economic activity. According to the Ministry of Cooperatives and Small and Medium Enterprises of the Undang-Undang (2014) , there are approximately 65.46 million micro, small, and medium enterprise units in Indonesia, as legally defined under Law Number 20 of 2008 concerning Micro, Small, and Medium Enterprises, contributing 60.5 % to gross domestic product and absorbing more than 97 % of the national workforce. This fact demonstrates that such enterprises form the backbone of the people's economy and play a vital role in sustaining national economic resilience (Republik, 2008).

Nevertheless, the development and competitiveness of these enterprises in Indonesia remain constrained by interregional disparities. Recent data at the time of this study show that the contribution of such enterprises in eastern Indonesia, including Papua and Maluku, amounts to only about 1.8 % of the national total, indicating that the economic potential of eastern Indonesia, particularly Papua, remains far from optimally utilized. This disparity is visible not only in the number of business units but also in productivity, market access, and the adoption of digital technology.

Enterprises in Papua Province play an important role in creating employment and sustaining the local economy. According to the Central Statistics Agency of Central (2023), approximately 38,000 active enterprise units operate in the province, dominated by micro enterprises at 92 %, small enterprises at 6 %, and medium enterprises at 2 %. The most common sectors are agriculture at 34 %, trade at 28 %, and fisheries at 14 %. However, about 63 % of enterprise actors in Papua have not obtained a business identification number, and 75 % have not utilized digital platforms for marketing, reflecting persistent weaknesses in legal formalization, management, and technology adoption that constrain enterprise development in the province. This pattern mirrors broader evidence from Indonesian small enterprises that social media adoption, even where digital infrastructure remains basic, is a significant enabler of continued operation during periods of disruption (Effendi, Sugandini, & Istanto, 2020).

Mamberamo Raya Regency is one of the newly formed autonomous regions in Papua Province, characterized by a relatively expansive territory, dispersed settlement patterns, accessibility that frequently depends on river and sea routes, and a population highly dependent on local natural resources for its livelihood. These conditions shape the type of local enterprise activity that predominates, including food processing based on local raw materials, handicrafts, small-scale village trade, small-scale fisheries, and village cooperative units. Limited transportation infrastructure, communication, and production facilities remain key factors constraining production scale and market access for local business actors.

In terms of potential, Mamberamo Raya Regency holds considerable opportunity in agriculture, fisheries, and non-timber forest products. The Papua Provincial Marine and Fisheries Office has designated Mamberamo Raya as one of the regions with white and black snapper as flagship commodities, most of which originate from the waters of Mamberamo Hilir District, alongside abundant freshwater fisheries potential, particularly along the Mamberamo River. This fisheries potential can become a foundation for local enterprise development if managed strategically and sustainably. Yet the contribution of the enterprise sector to the regional economy of Mamberamo Raya Regency remains comparatively low.

According to Regional Statistics of Mamberamo Raya Regency, approximately 420 to 450 enterprise units are spread across eight districts, most operating as micro-scale household enterprises among fishers and traders. Enterprises in Mamberamo Raya Regency are generally based on local natural potential, encompassing sago processing, distinctive handicrafts, and river or

marine fisheries, with these economic activities frequently conducted traditionally around the Mamberamo River basin. Mamberamo Hilir District, whose territory is predominantly riverine and coastal, holds substantial fisheries potential yet faces a core problem of minimal capital and market availability, since much of the local population consumes its own catch from sea and river. Capital constraints narrow the operating space of these enterprises considerably, since business actors struggle to fulfill orders because they lack the funds to expand production scale, and expanding production without adequate cold storage compromises fish quality (Central, 2023).

This situation is further compounded by limited transportation infrastructure, restricted market access, and insufficient interagency coordination. Remote areas with minimal access to information make it difficult for many business actors to expand their marketing networks and improve their managerial capacity, so that the competitiveness of enterprises in Mamberamo Raya remains comparatively low. At the same time, rapid digital technology development opens new opportunities for enterprise actors to access wider markets through social media, e-commerce, and digital payment systems, yet most enterprise actors in Mamberamo Raya have not been able to capitalize on this opportunity due to limited knowledge, internet infrastructure, and digital literacy.

This disparity indicates that the development strategy for enterprises in Mamberamo Hilir District has not operated at its maximum potential. A planned, measurable, and sustainable development strategy is essential to strengthen the capacity of business actors and reinforce regional economic competitiveness. The success of enterprise development depends greatly on the extent to which local government can formulate and implement strategies that are effective and suited to regional characteristics, including geographic, sociocultural, and accessibility factors. The Office of Industry, Trade, and Cooperatives, as the responsible technical agency, bears significant responsibility for integrating various development programs sourced from the regional budget and from ministries and other institutions. Given the potential of the fisheries sector, the government has recorded a very high fish production capacity. This research is therefore highly urgent for raising regional revenue, strengthening the local economy, and improving community living standards both nutritionally and economically. Comparable evidence from other fisheries-based enterprise contexts in Indonesia confirms that a systematically formulated development strategy, grounded in local potential and SWOT analysis, can meaningfully improve competitiveness and market reach for coastal micro-enterprises (Luthfia, Ridwan, & Zam, 2025).

Accordingly, the researcher considers it necessary to conduct a comprehensive study on the development strategy for fisheries enterprises as a driver of economic growth in Mamberamo Hilir District, Mamberamo Raya Regency. This study is expected to provide alternative strategic recommendations relevant to the social, economic, and geographic characteristics of the region, particularly the fisheries sector in Mamberamo Hilir District, while contributing scientifically and practically to the Office of Industry, Trade, and Cooperatives of Mamberamo Raya Regency in designing effective and sustainable enterprise development policy and programs.

2. Literature Review

2.1 Local Economic Development Theory

Local economic development theory, as articulated by Blakely and Leigh (2013), focuses on collaboration between local government, the private sector, and community groups to manage local resources in order to create employment and stimulate economic growth. This theory critiques top-down approaches and emphasizes the importance of participatory development tailored to a region's specific potential, arguing that generic economic solutions frequently fail because development must be grounded in the characteristics and comparative advantages unique to each locality. This approach positions the local community as the primary economic actor in creating development that is more inclusive and equitable.

Blakely and Leigh (2013) further propose four principal indicators for assessing the success of local economic development, namely the expansion of employment opportunities, the increase in community income, the empowerment of micro, small, and medium enterprises, and the improvement of institutional quality and cooperation. In this study, these four indicators serve as the

analytical framework for assessing the extent to which fisheries enterprises in Mamberamo Hilir District have contributed to local economic development. Recent applications of Local Economic Development theory to Indonesian coastal and fisheries settings similarly confirm that community-based, resource-specific strategies outperform generic regional development templates, particularly where infrastructural and institutional capacity is uneven across sub-districts. This body of work reinforces why the Blakely and Leigh framework, rather than an aggregate growth metric alone, offers the more appropriate lens for evaluating enterprise contribution in a geographically isolated district such as Mamberamo Hilir.

Based on this reasoning, the first proposition is advanced. Proposition one (*P1*): Fisheries enterprises in Mamberamo Hilir District contribute to local economic development to the extent that they expand employment opportunities, raise household income, strengthen enterprise capacity, and improve institutional cooperation, consistent with the four Local Economic Development indicators of Blakely and Leigh.

2.2 SWOT Analysis and Strategic Formulation

SWOT analysis, as explained by Rangkuti (2016), is a systematic identification of various factors to formulate a firm's strategy, based on logic that seeks to maximize strengths and opportunities while simultaneously minimizing weaknesses and threats. Suryatama (2016) similarly defines SWOT analysis as a strategic planning method used to evaluate an enterprise's strengths, weaknesses, opportunities, and threats, applied by analyzing and selecting the various considerations that influence these four factors. Eddy Yunus (2016) further clarifies that strengths and weaknesses originate from an enterprise's internal environment, whereas opportunities and threats originate from the external environment, a distinction that structures the analytical approach adopted in this study.

Applications of SWOT analysis to fisheries micro-enterprises across Indonesia have proliferated in recent years and consistently demonstrate the method's capacity to generate contextually grounded, actionable strategy recommendations. A study of milkfish enterprise development in Makassar found that an aggressive strategy combining product innovation and digital marketing significantly improved enterprise competitiveness (Luthfia et al., 2025). A closely related study of capture fisheries enterprise development along Sadeng coastal waters in Gunungkidul, using a combined IFE, EFE, IE, and SWOT matrix approach, found that the fishing enterprise occupied a growth-strategy cell of the internal-external matrix and identified the provision of productive facilities around the fishing port as the top development priority (Madina et al., 2024). Research on coastal micro-enterprise development in Pemalang similarly found that a locally tailored development strategy combining capital access and product diversification could meaningfully raise the local economic contribution of coastal enterprises (Mutiara & Safitri, 2024). Comparable work on catfish shredded-meat enterprise development found that a business positioned in the aggressive quadrant of the SWOT matrix should pursue expansion through product innovation, digital marketing, and brand strengthening, a combination shown to raise competitiveness and drive local fisheries-based economic growth (Damayanti et al., 2025). Studies of smoked-fish enterprise development in Bone Regency similarly identify human resource training, technological innovation, government support, and business legality as the principal strategic priorities emerging from SWOT analysis (Ohorella et al., 2022), while research on capture fisheries enterprise development in Medan Belawan confirms that internal and external factors such as climate and policy jointly shape the resulting development strategy (Armansyah & Handayani, 2025). Tilapia aquaculture research employing the same qualitative descriptive SWOT approach found that a strength-opportunity strategy consistently emerges as the primary strategy for fisheries enterprise development (Tricahya et al., 2023), a pattern echoed in research on fish-processing micro-enterprises in Jembrana, Bali, where a growth strategy focused on competitiveness and market expansion was identified as most appropriate (Febrianti & Fikriyah, 2023).

Based on this reasoning, the second proposition is advanced. Proposition two (P2): The internal strengths and weaknesses and external opportunities and threats facing fisheries enterprises in Mamberamo Hilir District can be systematically identified through qualitative SWOT analysis and

translated into a differentiated set of growth, defensive, improvement, and survival strategies appropriate to each enterprise segment. Comparable strategic management approaches applied to enterprise clusters elsewhere in Indonesia similarly show that a staged process of internal and external factor assessment followed by SWOT-based formulation can guide enterprises toward policy, program, and activity recommendations tailored to local conditions, a pattern also documented in a study of enterprise development priorities in Banyumas Regency, where entrepreneurship capacity emerged as the leading strategic priority (Ikhsani & Santoso, 2021). This finding is consistent with cross-country evidence showing that digital marketing adoption, even at a modest level of sophistication, is positively associated with improved business performance among small and medium enterprises operating in emerging-market conditions comparable to those found in eastern Indonesia (Deku et al., 2024).

2.3 Small Enterprise Constraints and Capital Theory

This concern is corroborated by international evidence on fish value chains, which finds that inadequate cold storage and post-harvest handling capacity are among the most consistent drivers of product and income loss for small-scale fishing communities in low- and middle-income countries (Kruijssen et al., 2020).

Enterprises of micro, small, and medium scale commonly face a recurring set of structural constraints. Fajar (2004) identifies internal constraints including insufficient capital and limited access to financing, weak business networks and market penetration capacity, and inadequate human resource quality, alongside external constraints comprising limited business infrastructure, short product shelf life, restricted market access, and an insufficiently conducive business climate. These constraints have been echoed and extended in more recent Indonesian enterprise research examining coastal and fisheries contexts specifically. Comparable structural constraints have also been documented among rural micro and small enterprises in other developing-country settings, where geographic isolation, limited institutional support, and weak market linkages jointly restrict enterprise growth in ways that closely parallel the conditions observed in Mamberamo Hilir District (Adeola et al., 2021).

A study of a traditional coconut oil enterprise in Southeast Sulawesi found that intensifying competition from cheaper substitute oils, coupled with fluctuating raw material prices, pressures enterprise margins in ways closely analogous to the price and competition pressures facing small-scale fisheries processors (Manik et al., 2023, as cited in Agriwiralodra, 2026). Complementary evidence from a study of enterprise development strategy formulation using SWOT and the Quantitative Strategic Planning Matrix found that capital access and technology adoption remain the two most binding constraints across a range of Indonesian micro-enterprise contexts, regardless of sector (Kewirausahaan dan Inovasi, 2024), a pattern corroborated across otherwise unrelated small-enterprise settings such as a traditional retail bookstore (Aulia & Widodasih, 2023), a tourism destination enterprise (Endarwita, 2021), a home-based banana snack enterprise (Mirna et al., 2024), and a tailoring service small enterprise (Rizkawati et al., 2025), suggesting that the SWOT-identified capital and capacity constraints observed in this study are not unique to the fisheries sector but reflect a broader structural condition of Indonesian micro-enterprise. Research specifically on capture fisheries enterprise development in Pekanbaru similarly documents that limited fishing gear and weak institutional coordination between fisheries and cooperative agencies constrain program implementation even where policy support exists on paper (Handrian & Hawa, 2022). Fish-processing enterprise studies elsewhere document comparable resilience patterns, showing that fisheries micro-enterprises facing periods of economic uncertainty draw on low capital intensity to sustain operations even when formal credit access is limited (Syamsari et al., 2022). Research on poverty alleviation strategy for fish-processing enterprises in coastal Tegal similarly found that empowerment programs targeting fisheries micro-enterprises can measurably reduce coastal poverty when capital, training, and market access are addressed jointly rather than in isolation (Kurnia et al., 2023). This capital constraint mirrors findings from other developing-country contexts, where access to microfinancing has been shown to mediate the relationship between formal access to finance and the realized growth of microenterprises (Angeles et al., 2019).

Based on this reasoning, the third proposition is advanced. Proposition three (P3): The internal weaknesses most frequently constraining fisheries enterprises in Mamberamo Hilir District, namely limited capital, traditional fishing gear, absent cold storage, and weak financial management, are consistent with the structural constraints identified in the broader Indonesian small-enterprise literature, indicating a generalizable rather than a purely localized pattern of disadvantage.

2.4 Market Access, Digital Technology, and Enterprise Growth

Market access and the adoption of digital marketing technology have emerged as recurring themes in recent fisheries enterprise research, reflecting a broader recognition that production capacity alone does not guarantee enterprise growth without a corresponding capacity to reach buyers. A study examining SWOT-based marketing strategy for a processed fish product enterprise found that digital marketing adoption, even at a basic level, meaningfully expanded the customer base beyond the immediate local market (Istiana, Utami, Randi, & Adita, 2022). Research on product innovation's role in fisheries enterprise competitiveness in the digital era similarly found that innovation in packaging and product form, combined with digital promotion, was the single strongest predictor of competitive improvement among the enterprises studied (Puspitasari & Andayani, 2023).

At the same time, research on sustainable fisheries development challenges in Indonesia cautions that market and technology gains can be undermined if underlying resource sustainability and infrastructure constraints are not addressed in parallel (Yuniarti & Arifin, 2020). Evidence on digital marketing adoption among fisheries enterprises more broadly confirms that even modest digital marketing investment is associated with measurable sales growth, reinforcing the potential value of the digital opportunity identified in this study (Hariyanto & Prasetyo, 2021). Research on milkfish enterprise development strategy in South Sulawesi similarly identifies product diversification and market network expansion as the most consistently recommended strategic priorities across comparable coastal fisheries settings (Nugraha & Yuliani, 2021).

Community empowerment research in coastal micro-enterprise development finds that fisheries-based enterprises can become an effective vehicle for broader coastal livelihood improvement when supported by structured government programs (Mulyani & Firmansyah, 2022). A recent identification study of fish-cracker micro-enterprise problems in Tanjungpinang similarly finds that limited capital and raw material supply instability constrain small fisheries-processing enterprises in ways directly analogous to those documented in Mamberamo Hilir District by Identifikasi (2025), while research on coastal community empowerment strategy in the Riau Islands Province found that innovation in catch-processing methods can meaningfully raise the value added captured by fishing communities when paired with sustained institutional support (Wardana, Erlisya, Simbolon, Simanjuntak, & Firman, 2025). These findings are consistent with broader assessments of Indonesian micro, small, and medium enterprise development, which similarly identify limited market access and slow technology adoption as persistent barriers to enterprise growth outside the country's major economic centers (Tambunan, 2019).

Based on this reasoning, the fourth proposition is advanced. Proposition four (P4): Market demand growth and digital technology adoption represent the most significant external opportunities for fisheries enterprises in Mamberamo Hilir District, but realizing this opportunity requires simultaneous attention to the underlying production and infrastructure constraints identified under the weaknesses and threats components of the SWOT framework.

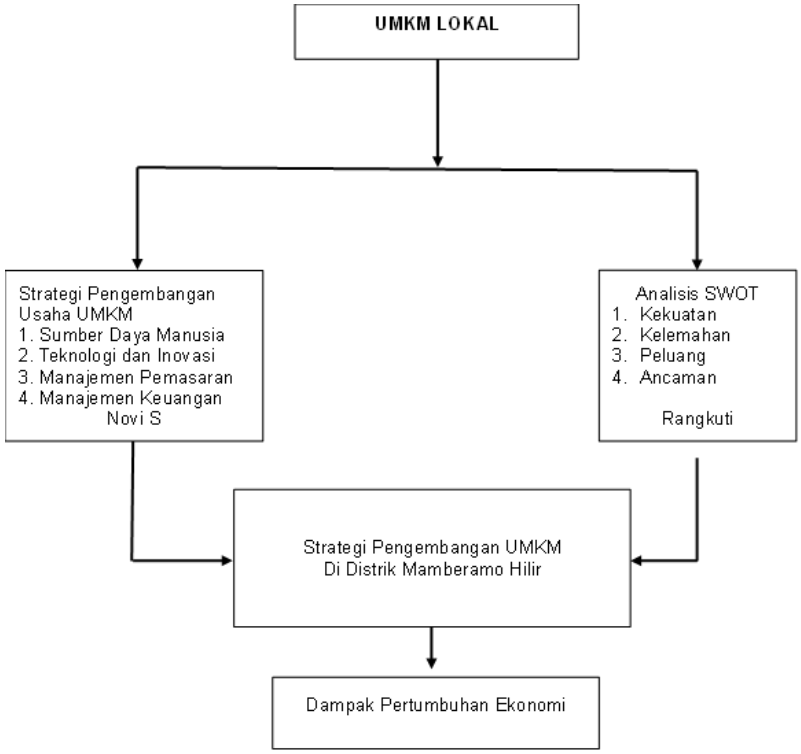

Figure 1. Conceptual framework of fisheries MSME development and its economic impact

Figure 1 depicts the conceptual framework guiding this study. Local fisheries enterprises are shaped jointly by an enterprise development strategy, spanning human resources, technology and innovation, marketing management, and financial management, and by a SWOT analysis of strengths, weaknesses, opportunities, and threats. These two analytical strands converge into a development strategy specific to Mamberamo Hilir District, which in turn is expected to generate a measurable impact on local economic growth, closing the analytical loop that this study empirically tests.

3. Methodology

3.1 Research Design and Location

This study employs a descriptive qualitative approach with a case study design to examine the development strategy of fisheries enterprises in Mamberamo Hilir District, Mamberamo Raya Regency, Papua Province. This location was selected because Mamberamo Hilir District constitutes the center of local economic activity and the hub of fisheries enterprise activity in the region. In addition, the district possesses substantial fisheries resource potential that has not yet been optimally managed as a driver of local economic growth. The research was conducted from December 2025 through February 2026.

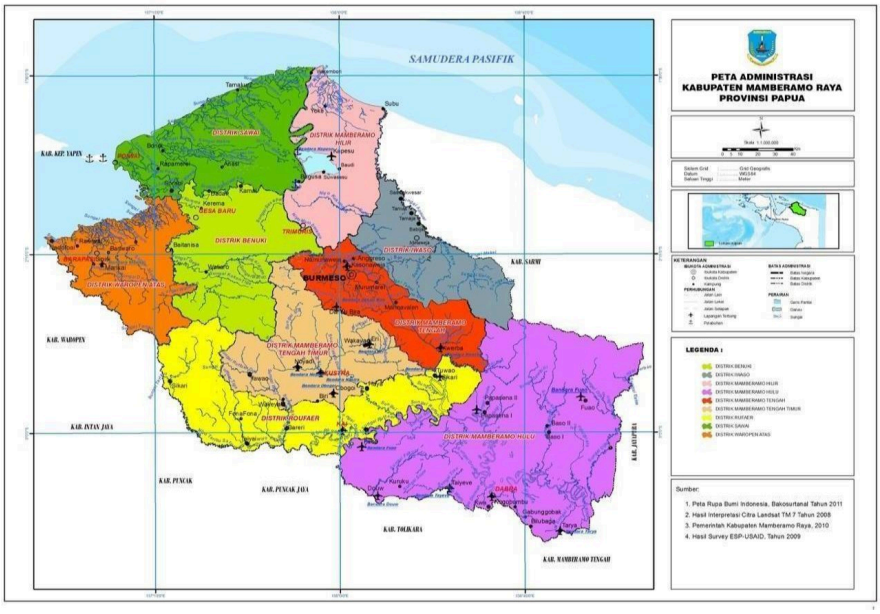

Figure 2. Administrative map of Mamberamo Raya Regency

Figure 2 shows the administrative boundaries of Mamberamo Raya Regency and the position of Mamberamo Hilir District within it. The regency covers a total area of 23,814 square kilometers, bordered by the Pacific Ocean to the north, Puncak Jaya and Tolikara Regencies to the south, Waropen Regency and the Yapen Islands to the west, and Sarmi Regency to the east. Mamberamo Hilir District, the smallest of the regency's nine districts by land area at 2,078 square kilometers, or 8.72 percent of the regency's total area, lies at the river's outlet to the sea, giving it the pronounced coastal and riverine character central to this study.

3.2 Data Types and Sources

This study collects both primary and secondary data. Primary data were obtained directly through observation, field surveys, and in-depth interviews with respondents. Secondary data were obtained from existing sources, including the Mamberamo Raya Regional Work Plan document for 2025, regional statistics compiled by the Central Statistics Agency, books, reports, journals, and proceedings.

Primary data sources comprised the Head of the Office of Industry, Trade, and Cooperatives of Mamberamo Raya Regency, fishers in Mamberamo Hilir District, fish traders, and community members or consumers as buyers. The researcher applied judgment sampling, a non-probability sampling technique in which the observed units are selected based on the researcher's consideration of which units are deemed most useful and representative for the research purpose. Secondary data sources included the 2025 Regional Work Plan document, the Government Institution Performance Report of the Office of Industry, Trade, and Cooperatives, statistical data on enterprises and cooperatives from the Central Statistics Agency of Mamberamo Raya Regency, and prior scientific journals, books, and research on enterprise development strategy.

3.3 Population and Sample

The population of this study is the number of enterprises operating in Mamberamo Hilir District together with several parties from the Trade Office serving as informants to deepen the research process. Table 1 presents the enterprises located in Mamberamo Hilir District that constitute the study population.

Table 1. Fisheries and related enterprises in Mamberamo Hilir District

Enterprise Type	Number of Units
Fishers	50

Enterprise Type	Number of Units
Fish Traders	12
Kiosks	10
Food Stalls	1
Processed Fish Traders	6
Total	79

Table 1 shows that fishers constitute the dominant enterprise category in Mamberamo Hilir District, accounting for 50 of the 79 registered units, followed by fish traders at 12 units, kiosks at 10 units, processed fish traders at 6 units, and a single food stall. This distribution confirms that more than 86 percent of enterprise units in the district maintain a direct link to the fisheries sector, underscoring the centrality of fisheries activity to the local enterprise economy.

The sample for this study was drawn using judgment sampling. The researcher used an interview method for the sampling technique, selecting informants based on specific considerations regarding who is deemed most knowledgeable and best positioned to understand the problem under study. Data collection accordingly drew on all twenty members selected from the population. Table 2 presents the respondent composition included in this study.

Table 2. List of research respondents

Respondent Category	Number of People
Head of the MSME Division, Office of Industry, Trade, and Cooperatives	1
Head of the Creative Economy Section, Office of Industry, Trade, and Cooperatives	1
Fishers	4
Fish Traders	7
Community Figures or Consumers	7
Total	20

Table 2 shows that the twenty respondents span both government officials and enterprise-side stakeholders, ensuring that the perspectives captured include not only the operational realities faced by fishers and traders but also the policy and institutional perspective held by the relevant technical agency.

3.4 Data Collection Methods

In this qualitative study, data collection techniques were focused on obtaining information that is deep, comprehensive, and consistent with the natural setting in the field regarding the fisheries enterprise development strategy in Mamberamo Hilir District. Primary data collection therefore did not use a scaled questionnaire, but instead relied on three principal qualitative techniques.

In-depth interviews were conducted semi-structurally with key informants selected purposively through judgment sampling based on their level of understanding of and involvement in fisheries enterprise issues. Informants included officials of the Office of Industry and Trade of Mamberamo Raya Regency as well as local fisheries enterprise actors. In conducting the interviews, the researcher used an interview guide as an instrument to probe specific data concerning institutional aspects, human resource capacity, capital, market access, and the strengths, weaknesses, opportunities, and threats facing their enterprises.

Observation was conducted through direct field visits to Mamberamo Hilir District to document the reality of fisheries enterprise economic activity. The observation focus included the availability of

fishing facilities and infrastructure, the fish processing process, the distribution and trading chain in local markets, and the condition of supporting or constraining regional infrastructure. Observation results were recorded as field notes that served to validate and complement information obtained through interviews, in a form of technique triangulation.

Documentation was conducted to compile relevant secondary data supporting the research focus, including regional profiles, relevant agency work plan reports, Gross Regional Domestic Product data from the Central Statistics Agency of Mamberamo Raya Regency, regional government regulations concerning enterprise empowerment, business licensing records, and photographic documentation of fisher activities and field interviews.

3.5 Data Analysis Method

3.5.1 Enterprise Development Analysis Method

Following the enterprise development indicator framework, four principal indicators were measured. The innovation and technology indicator was measured through the level of new design adoption, production quality control standards, participation in technology transfer, and ownership of intellectual property certificates. The human resource indicator was evaluated based on the level of entrepreneurial understanding, participation in technical or managerial training, and the capacity to generate new business ideas. The marketing indicator was assessed by examining the routine conduct of market research activities, the expansion of distribution networks, the utilization of promotional tools, and engagement with professional marketing consultants. The financial management indicator was measured through the discipline of budget planning, the efficiency of fund allocation, and the effectiveness of expenditure control systems.

3.5.2 Qualitative Descriptive SWOT Analysis Method

The SWOT analysis in this study was conducted as a qualitative narrative process aimed at identifying, describing, and interpreting the internal and external strategic factors influencing the development of fisheries enterprises in Mamberamo Hilir District. Qualitative SWOT analysis differs from quantitative SWOT analysis employing numerical ratings, instead focusing on a deep understanding of local context and the meaning of strategic factors for enterprise actors.

The analysis proceeded through four stages. The first stage identified SWOT factors from field data, in which qualitative data from in-depth interviews, observation, and documentation were analyzed to identify themes related to strengths, weaknesses, opportunities, and threats, through repeated reading of interview transcripts, highlighting of relevant text segments, grouping of similar themes into the four SWOT categories, calculation of theme frequency across responses, and validation against observation and documentation data through technique triangulation. The second stage involved deep description and interpretation of each identified SWOT factor, based on the frequency with which informants mentioned a given factor, classified as high frequency above 80 %, moderate frequency between 50 and 80 %, and low frequency below 50 %, together with the intensity of discussion and the local sociocultural context attached to each factor. The third stage synthesized and mapped the interconnections among factors, identifying four combination types, namely strengths combined with opportunities yielding a growth strategy, strengths combined with threats yielding a defensive strategy, weaknesses combined with opportunities yielding an improvement strategy, and weaknesses combined with threats yielding a survival strategy. The fourth stage formulated narrative strategy statements specifying the core strategy, its strategic rationale grounded in the SWOT analysis, concrete implementation elements, the actors and targets responsible, and the indicators by which success would be monitored.

To ensure the quality of the qualitative SWOT analysis, several validation mechanisms were applied, comprising technique triangulation by comparing interview findings against observation and documentation, source triangulation by verifying interpretations against respondents from varying socioeconomic positions, member checking by seeking feedback from key informants regarding the interpretations reached, and an audit trail documenting each stage of coding, categorization, and interpretation so that the analytical process remains traceable.

3.5.3 Economic Impact Analysis Method

The Community Economic Success Indicators proposed by Blakely and Leigh (2013) affirm that the success of economic development is measured not only by aggregate growth in gross domestic product but by the extent to which local communities genuinely experience its benefits. Four principal indicators were applied to assess enterprise contribution to local economic development, namely the expansion of employment opportunities, the increase in community income, the empowerment of micro, small, and medium enterprises in production and marketing, and the improvement of institutional quality and cooperation between enterprise actors and local government.

3.6 Operational Definitions

This study encompasses three principal foci, namely enterprise development strategy, local economic growth, and SWOT analysis. Enterprise development strategy is measured through the four indicators of innovation and technology, human resources, marketing, and financial management described above, each operationalized concretely for the fisheries context, for example through the adoption of new designs for processed fish products such as smoked fish, salted fish, or shredded fish floss, and through the discipline of separating household from business finances. Local economic growth, or economic impact, is evaluated using the four Blakely and Leigh indicators of expanded employment, increased community income, enterprise empowerment, and institutional quality, each operationalized in terms directly relevant to fisheries livelihoods in Mamberamo Hilir District.

4. Results and Discussion

4.1 Respondent Characteristics

The twenty respondents in this study were dominated by individuals in the productive age range of 30 to 49 years, comprising fourteen of the twenty respondents, with the remainder concentrated in the 20 to 30 age bracket and a small number in older age groups. In terms of educational attainment, respondents were dominated by senior high school graduates at twelve individuals, followed by junior high school graduates at five, elementary school graduates at two, and a single university graduate. By gender, respondents were dominated by men at twelve individuals, reflecting the physically demanding nature of capture fishing, while women were more concentrated in trading and marketing roles.

4.2 Internal and External Conditions Affecting Fisheries Enterprise Development

4.2.1 Internal Factors: Strengths

Fisheries enterprises in Mamberamo Hilir District, particularly in Warembori, Bagusa, and Kapeso villages, possess substantial freshwater and estuarine fisheries potential, with principal catch commodities including tilapia, snapper, grouper, milkfish, catfish, crab, and shellfish. Interview findings identify five principal strengths summarized in Table 3.

Table 3. Analysis of strength factors

Strength Factor	Frequency	Summary Finding
Multigenerational business experience	15 of 20, 75 %	Fishers report 15 to 30 years of experience, providing deep knowledge of fishing grounds, weather patterns, and catch preservation
Abundant fish resource availability	18 of 20, 90 %	The district's marine and river waters provide a consistent and diverse supply of fish species year round
Distinctive value-added processed products	14 of 20, 70 %	Smoked and salted fish products carry a distinctive local flavor already recognized by consumers
Established relationships with regular customers	16 of 20, 80 %	Long-standing trust between enterprise actors and consumers supports consistent sales

Strength Factor	Frequency	Summary Finding
Proximity to raw material sources	12 of 20, 60 %	Enterprises are located close to landing sites and local markets, reducing transport costs

Table 3 summarizes the five principal strengths identified through interview analysis and shows that the most fundamental strength is the multigenerational business experience accumulated by enterprise actors, reported by 75% of respondents, encompassing deep familiarity with local weather and seasonal patterns, technical catching and preservation skill, and insight into local market preferences. This experience constitutes an intangible asset that competitors from outside the district cannot easily replicate. The abundant and diverse availability of fish resources, reported by 90% of respondents, provides raw material certainty that enables product diversification, while proximity to raw material sources and local markets, reported by 60% of respondents, reduces logistics costs and supports rapid response to demand. Distinctive value-added processed products such as smoked and salted fish, reported by 70% of respondents, function as a durable competitive differentiator, and established relationships with regular customers, reported by 80% of respondents, generate organic loyalty and word-of-mouth marketing that represents a valuable socioeconomic asset within an informal economy.

4.2.2 Internal Factors: Weaknesses

Table 4 presents the five principal weaknesses identified through the same interview-based procedure.

Table 4. Analysis of weakness factors

Weakness Factor	Frequency	Summary Finding
Limited business capital	19 of 20, 95 %	The most critical constraint, affecting the acquisition of production equipment, capacity expansion, and infrastructure investment
Traditional technology and fishing gear	15 of 20, 75 %	Most enterprises still use very simple, often generations-old equipment, lowering productivity
Absence of cold storage facilities	17 of 20, 85 %	Without refrigeration, fish must be sold quickly, weakening fishers' bargaining position
Weak financial record keeping	16 of 20, 80 %	Most actors keep only rudimentary or inconsistent financial records, obscuring true profitability
Limited digital marketing and product packaging	14 of 20, 70 %	Marketing remains traditional, and packaging lacks labeling, branding, or attractive design

Table 4 shows that limited business capital constitutes the single most critical constraint, cited by 95% of respondents, directly restricting the acquisition of modern production equipment, capacity expansion, and investment in preservation infrastructure such as cold storage. This finding is consistent with the broader Indonesian small-enterprise literature identifying capital access as the most binding constraint across sectors (Fajar, 2004; Kewirausahaan dan Inovasi, 2024). The continued reliance on traditional fishing gear and technology, reported by 75% of respondents, similarly constrains productivity and adaptation to new techniques, while the absence of cold storage, reported by 85% of respondents, forces immediate sale of catch and weakens fishers' bargaining position with buyers. Weak financial record keeping, reported by 80% of respondents, obscures true profitability and impedes access to formal credit, and limited digital marketing capacity together with unattractive product packaging, reported by 70% of respondents, narrows market reach and depresses achievable sale prices.

4.2.3 External Factors: Opportunities

Table 5 presents the five principal external opportunities identified.

Table 5. Analysis of opportunity factors

Opportunity Factor	Frequency	Summary Finding
High and stable market demand for fisheries products	18 of 20, 90 %	Fish is a staple food consumed routinely by households, restaurants, and institutions
Digital technology development for marketing	13 of 20, 65 %	Social media and online marketplaces could expand reach, though largely unexploited so far
Partnership opportunities with modern retail, restaurants, and catering	14 of 20, 70 %	Formal partnerships could secure larger, steadier orders and better prices
Product innovation to raise value added	12 of 20, 60 %	New products such as fish floss, nuggets, and chips could raise margins substantially
Government support through enterprise programs	10 of 20, 50 %	Training, capital assistance, and certification programs exist but remain underutilized

Table 5 identifies high and stable market demand, reported by 90% of respondents, as the most fundamental opportunity underpinning enterprise viability, since fish as a staple food commands consistent demand from households, food stalls, restaurants, and institutions. Digital technology for marketing, recognized by 65% of respondents as an opportunity yet still largely unexploited, offers access to markets far beyond the immediate locality through social media and online marketplaces. Partnership opportunities with modern retail, restaurants, and catering services, reported by 70% of respondents, could open more secure and sustained distribution channels, while product innovation toward higher value-added forms, reported by 60% of respondents, is already emerging in nascent form through products such as tilapia floss. Government support through enterprise programs, acknowledged by only 50% of respondents, remains substantially underutilized despite its availability, pointing to an information and outreach gap rather than a genuine absence of support.

4.2.4 External Factors: Threats

Table 6 presents the five principal external threats identified.

Table 6. Analysis of threat factors

Threat Factor	Frequency	Summary Finding
Extreme weather and high waves	16 of 20, 80 %	The most serious threat, sharply reducing fishing days during the October to April storm season
Fluctuating fish prices and raw material supply	15 of 20, 75 %	Price volatility driven by seasonal catch variation and weak bargaining position
Competition from local and outside traders	14 of 20, 70 %	Simultaneous oversupply drives prices down for all sellers, and outside products increase competitive pressure
Shifting, more selective consumer preferences	10 of 20, 50 %	Consumers increasingly expect hygiene, packaging, and consistent product availability
Limited public infrastructure	12 of 20, 60 %	Poor roads, unstable electricity, and minimal internet access raise costs and restrict digital adoption

Table 6 identifies extreme weather and high waves as the most serious threat, reported by 80 percent of respondents, since the district's location along marine and river waters makes catching activity highly dependent on weather conditions, with fishing days sharply curtailed during the October to April storm season. Fluctuating fish prices and raw material supply, reported by 75% of respondents, create chronic profit uncertainty, since prices collapse during periods of abundant catch while production costs rise when supply is scarce. Competition among local traders and from

products entering from outside the district, reported by 70% of respondents, intensifies this pressure, while shifting and more selective consumer preferences, reported by 50% of respondents, demand continuous improvement in hygiene, packaging, and presentation. Limited public infrastructure, reported by 60% of respondents, compounds nearly every other operational challenge by raising logistics costs and restricting the digital adoption needed to capture the opportunities identified above.

4.3 Strategic Interconnection and Formulation

Synthesizing the four SWOT components reveals four distinct strategic combinations, summarized in Table 7.

Table 7. Qualitative internal and external strategy matrix

Combination	Internal Factor	External Factor	Strategy Type
Strengths and Opportunities	Experience, abundant resources, distinctive products	High demand, digital technology, partnership potential	Growth: market expansion, digitalization, volume increase
Strengths and Threats	Customer relationships, local environmental knowledge	Extreme weather, price fluctuation, competition	Defensive: consolidation, collaboration, stabilization
Weaknesses and Opportunities	Limited capital, traditional technology, weak management	Government programs, village fund access, financial partnerships	Improvement: capital access, technology transfer, management training
Weaknesses and Threats	Weak infrastructure, weak management, micro scale	Intense competition, unfavorable market composition	Survival: institutional consolidation, formal compliance, basic efficiency

Table 7 demonstrates that a single uniform strategy cannot serve the full population of fisheries enterprises in Mamberamo Hilir District. For enterprises with relatively stronger capital access and more trained human resources, a growth strategy combining digitalization and market expansion is appropriate, exemplified by concrete steps such as establishing a social media presence, using messaging applications to receive orders directly from restaurants, and formalizing supply agreements with three to five buyers. For enterprises facing acute weather and price volatility, a defensive strategy built on formal fisher groups, collectively agreed minimum prices, and mutual catch-sharing arrangements during adverse weather can stabilize household income. For enterprises constrained primarily by capital and technology, an improvement strategy centered on accessing village funds for shared cold storage investment, technical training from the fisheries office, and simplified bookkeeping training offers a realistic path forward. For the most vulnerable micro-scale enterprises facing both severe internal weakness and external threat, a survival strategy prioritizing formal business registration, cooperative formation, and shared operational cost arrangements is the necessary first step before growth-oriented strategies become viable. This differentiated approach is consistent with strategy formulation studies elsewhere in the Indonesian fisheries sector, which likewise find that enterprise segments require distinct rather than uniform strategic prescriptions depending on their baseline capacity (Damayanti et al., 2025; Ridha, 2024).

4.4 The Role of Fisheries Enterprises as Livelihood and Economic Driver

Fisheries activity in Mamberamo Hilir District functions simultaneously as the principal livelihood source for fishing households and as a driver of micro-scale economic activity through a measurable multiplier effect. Of the 79 enterprise units recorded in the district, 50 units are fishers, 12 are fish traders, 6 are processed fish traders, 10 are kiosks, and 1 is a food stall, meaning more than 86% of enterprise units maintain a direct link to the fisheries sector. Table 8 summarizes the economic chain generated by fisheries enterprise activity. This pattern aligns with international evidence showing that improving financial inclusion among small-scale fishing households strengthens their

capacity to absorb economic shocks and sustain livelihood activity over time (Pomeroy et al., 2020).

Table 8. Economic chain generated by fisheries enterprise activity

Actor	Role in the Economic Chain
Fishers, 50 units	Supply fresh fish from the sea and the Mamberamo River
Fish traders, 12 units	Distribute fresh fish to markets and local consumers
Processed fish traders, 6 units	Process fish into smoked fish, salted fish, and floss for added value
Food stalls, 1 unit	Absorb catch as raw material for ready-to-eat meals
Kiosks and grocery traders, 10 units	Supply fishers' operational needs, including fuel and provisions
Porters and casual laborers	Absorb informal labor around the harbor and market

Table 8 illustrates that every kilogram of fish caught by a fisher generates income not only for the fishing household but also for traders, processors, laborers, and food stall operators further along the chain. Total fisheries production rose sharply from 2,491 tons in 2022 to 5,312,421 kilograms in 2025, with a production value reaching approximately IDR 114.5 billion, indicating substantial potential economic circulation from this sector. Catch from Mamberamo Hilir District has also established initial distribution routes to Sarmi, Serui, and Jayapura, suggesting that this micro-scale economic impact could develop into a broader regional impact if distribution infrastructure were strengthened.

Assessed against the four Blakely and Leigh indicators, the expansion of employment opportunities is met partially, since fisheries activity remains the only substantial source of informal employment for the working-age population, with a natural gender-based division of labor in which men dominate capture activity and women dominate processing and marketing. The increase in community income is likewise met partially, since rising production value between 2022 and 2025 has directly benefited fishing households, reinforced by government training programs and promotional facilities, though gains remain concentrated among households that have successfully diversified into processed products. Enterprise empowerment in production and marketing remains the least developed indicator, given the absence of cold storage, continued reliance on traditional gear, and the presence of only a single financial institution branch in the entire district, which effectively closes off formal credit access for most enterprise actors. Institutional quality and cooperation remain at an early stage, since most units are still informal and lack legal entity status, though government training and promotional facilitation together with plans for a fishers' cooperative represent a positive, if still nascent, direction. This outcome is consistent with broader evidence that the empowerment of small and medium enterprises functions as a determinant of regional economic growth when accompanied by adequate government policy support and strengthened human resource capacity (Surya et al., 2021).

4.5 Discussion

The findings of this study affirm that fisheries enterprises in Mamberamo Hilir District possess a substantial foundation of internal strength, particularly abundant fisheries resources, multigenerational experience, and distinctive processed products, consistent with the view of Eddy Yunus (2016) that positive internal factors constitute a source of competitive advantage that must be identified and maximized in strategy formulation. At the same time, the dominant internal weakness, cited by 95 percent of respondents as limited capital, aligns closely with the finding of Fajar (2004) that inadequate capital, weak business networks, and low human resource quality constitute the principal problems consistently confronting enterprises across Indonesia, including in underdeveloped regions of eastern Indonesia.

The absence of any enterprise segment falling solely into a strengths-only-matched-with-opportunity pattern without corresponding weakness exposure reinforces the conclusion reached in comparable fisheries SWOT studies that growth cannot be pursued in isolation from capacity building (Ohorella, Baskoro, & Harijati, 2022; Tricahya, Hatono, & Aprilia, 2023). Regarding the mediating role of government support programs, the finding that only half of respondents were aware of existing assistance programs echoes broader evidence that enterprise support policy in Indonesia frequently suffers from an information and outreach gap rather than a genuine absence of resources (Kewirausahaan, 2024).

This study is not fully consistent with Setyanto, Samudro, Pratama, and Soesilo (2015) view that continuous mentoring alone enables enterprises to overcome internal weaknesses and move up in scale. In the study location, mentoring has indeed been provided, but its results remain limited because of the difficult geographic terrain and the lack of sustained technical accompaniment. Similarly, while Ariani and Utomo (2017) competitiveness-based development framework suggests that enterprises able to exploit market opportunity and product innovation will see optimal development, the Mamberamo Hilir case shows that even where fisheries potential is substantial, limited innovation capacity, low technology mastery, and minimal market access continue to constrain competitiveness from developing to its fullest extent.

Overall, the SWOT analysis demonstrates that fisheries enterprise development in Mamberamo Hilir District holds considerable potential if strengths and opportunities are optimally utilized, yet internal weaknesses and external threats remain the principal obstacles. An integrated strategy combining increased business capital, modernized fishing gear, human resource strengthening, infrastructure provision, and expanded market access is therefore required for fisheries enterprises to grow sustainably and competitively, consistent with the differentiated growth, defensive, improvement, and survival strategy framework formulated in Section 4.3.

5. Conclusions

5.1 Conclusion

Fisheries enterprises in Mamberamo Hilir District hold substantial potential to be developed as a driver of local economic growth, supported by abundant fish resource availability, a strategic geographic location, and multigenerational fishing experience among the local community. Nevertheless, enterprise development still faces considerable obstacles, including limited business capital, the use of simple fishing gear, the absence of fish preservation facilities, weak marketing capability, and limited supporting infrastructure. At the same time, opportunities exist in the form of rising market demand for fisheries products, digital technology development, and government program support. Based on the interconnection of these SWOT factors, the strategies required include strengthening human resource capacity, strengthening capital access, providing fisheries facilities and infrastructure, developing value-added processed products, and expanding market access through partnership and digital technology utilization, all of which are expected to improve the competitiveness and sustainability of fisheries enterprises in Mamberamo Hilir District.

Fisheries enterprises play an important role as a source of livelihood for fishing families and as a driver of micro-scale economic activity in Mamberamo Hilir District. Fisheries activity is not only the principal income source for fishers but also creates a multiplier effect involving fish traders, processors of smoked and salted fish, food stall operators, porters, and other supporting business actors. The presence of fisheries enterprises has contributed to expanding employment opportunities and raising community income. Nevertheless, this role remains suboptimal because of continuing limitations in capital, technology, marketing, and business partnership. Sustained strengthening of fisheries enterprises is therefore necessary so that this sector can become a genuine driving force for local economic growth and improved welfare among the people of Mamberamo Hilir District. This livelihood function reflects a broader conceptual shift in small-scale fisheries scholarship toward viewing fishing communities not merely as producers but as cohesive social and economic units whose collective welfare depends on the strength of local institutions.

5.2 Research Limitations

This study is limited by its case study design confined to a single district, which restricts the generalizability of findings to other fisheries-dependent regions of Papua with different geographic and institutional characteristics. The purposive judgment sampling of twenty informants, while appropriate for the depth of qualitative inquiry pursued, does not permit statistical generalization to the full enterprise population. In addition, the study relies substantially on self-reported interview data, which may be subject to recall bias or social desirability effects, although triangulation with observation and documentation was applied to mitigate this concern.

5.3 Directions and Future Study

The local government, through the Office of Industry, Trade, and Cooperatives, should prioritize the construction of critical physical infrastructure, particularly shared cold storage facilities and improved fish landing sites. The government should also open more accessible financing channels for micro-scale fishers and provide sustained mentoring on financial literacy and business management. Enterprise actors, particularly fishers and fish traders, are strongly encouraged not to operate in isolation but to strengthen collective institutions, such as cooperatives or joint business groups, in order to stabilize prices and secure raw material supply, while beginning to adopt simple technology for more durable product packaging and digital media for reaching buyers beyond the traditional local market. Future researchers are encouraged to conduct a more focused feasibility study on the economic viability of cold storage infrastructure investment in riverine and coastal areas, and to examine the effectiveness of the fish marketing supply chain from Mamberamo Hilir District to other parts of Papua in order to support the scaling of these enterprises toward medium and larger operations.

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