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Business Feasibility Study on Litopenaeus Vannamei Feed Distribution on Bengkalis Island

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Abstract
This study evaluates the business feasibility of a Pacific white shrimp (Litopenaeus vannamei) feed distribution business on Bengkalis Island, based on five core dimensions: market, technical and operational, management and human resources, legal and environmental, and financial and investment aspects. Employing a descriptive mixed-methods design, empirical data were collected through in-depth interviews, field observations, and documentation involving five active shrimp farming businesses. The findings indicate potential market opportunities, with feed requirements ranging from 25 to 249.6 tons per production cycle across the five sampled farms, while purchase prices range from IDR 17,000 to IDR 19,480 per kilogram. The findings also identify several existing supply channels involving suppliers and agents from Medan, Lampung, Dumai, and Bengkalis. These findings suggest opportunities for developing more localized distribution channels and improving supply efficiency. From an operational perspective, inventory management using the First-In, First-Out (FIFO) method and efficient transportation route planning are recommended to support feed quality and supply continuity. However, a comprehensive assessment of financial feasibility cannot yet be established because detailed cost-structure data from distribution actors are unavailable. Therefore, this study provides an overview of market potential and operational considerations for stakeholders interested in developing shrimp feed distribution businesses on Bengkalis Island.

Keywords:
Distribution Business; Business Feasibility; Shrimp Feed; Bengkalis Island; Vannamei Shrimp.

1. INTRODUCTION

The aquaculture sector, particularly the cultivation of Pacific white shrimp (Litopenaeus vannamei), plays a crucial role in stimulating the economy of coastal communities. The success of this commodity relies not only on rearing techniques and harvest yields but is also heavily influenced by the availability of feed as the primary production input. According to the Directorate General of Aquaculture (2024), feed accounts for approximately 72% of the operational cost structure of vannamei shrimp farming. Therefore, feed availability, price stability, and supply chain continuity are important factors affecting production costs and the sustainability of shrimp farming, while also creating potential business opportunities for feed distributors. Understanding shrimp feed demand is therefore important for identifying market opportunities and developing distribution strategies that can accommodate the needs of shrimp farming businesses. Ahlulnasar et al. (2025) examined shrimp feed demand, highlighting the importance of feed requirements as a consideration in shrimp farming and the development of related business opportunities.

Previous studies have examined feed management and its contribution to shrimp farming performance. Akbarurrasyid et al. (2023) examined intensive white shrimp cultivation in relation to growth rate, survival rate, and feed conversion ratio, providing insights into the production performance of vannamei shrimp farming. Asmild et al. (2024) also examined economies of scale in Indonesian shrimp farming, providing insights into how farming scale relates to production efficiency and business performance. (Nuriansyah &

Maulana, 2023) analyzed the financial feasibility of semi-intensive vannamei shrimp farming in plastic-lined ponds in Teluk Pambang Village and highlighted the importance of production costs in determining business performance. (Andriani & Pratama, 2023) examined nutritional management to optimize shrimp growth, while Astuti et al (2023) and Maulana & Dwiyanti (2025) discussed feed efficiency through blind feeding techniques and automatic feeders. Although these studies provide insights into feed management at the farm level, research examining the market potential and business feasibility of shrimp feed distribution in island regions, particularly on Bengkalis Island, remains limited.

Bengkalis Regency, located in Riau Province, has an active aquaculture sector. According to Statistics of Riau Province (2025), the volume of aquaculture production in Bengkalis Regency reached 3,265,755 kg in 2023. This figure represents total aquaculture production across commodities and does not specifically indicate vannamei shrimp production. This study examines five active shrimp farming businesses: CV Ketam Putih Abadi Jaya, CV Bina Usaha, Tambak Amir Syarifuddin, Tambak Vincent Kho, and PT Genesis Kembong Jaya. The five businesses demonstrate variations in feed requirements, purchasing prices, estimated feed expenditures, and supply channels. These characteristics provide empirical information for examining the potential demand for shrimp feed distribution in the study area.

This study evaluates the potential and feasibility of a shrimp feed distribution business through five dimensions: market, technical and operational, management and human resources, legal and environmental, and financial and investment aspects. The market aspect focuses on feed requirements, purchasing prices, and existing supply channels at the farm level. The other dimensions are examined descriptively through interviews, field observations, and documentation to identify operational requirements and factors relevant to establishing a distribution business.

However, the assessment is subject to limitations because comprehensive data from distributors and principal suppliers were not available. Information concerning wholesale purchasing prices, initial investment, inter-island transportation costs, warehousing expenses, labor costs, and projected cash flows could not be obtained in sufficient detail. In addition, data from the five sampled farms represent the demand characteristics of the respondents and cannot be used to establish the total shrimp feed market demand across Bengkalis Island. Consequently, the financial feasibility of the proposed distribution business cannot yet be conclusively determined.

Based on these conditions, this study aims to identify the market potential and assess the business feasibility of Pacific white shrimp feed distribution on Bengkalis Island using the available empirical data. The findings are expected to provide an initial reference for stakeholders in understanding local feed demand, existing supply channels, and the operational considerations involved in developing a distribution business. Further research involving distributors and manufacturers is also necessary to obtain more comprehensive financial data and support a more detailed investment feasibility assessment.

2. RESEARCH METHOD

The qualitative approach is used to describe the operational conditions of shrimp farming businesses, feed procurement practices, supply channels, management practices, and information concerning legal and environmental aspects. Meanwhile, simple quantitative analysis is used to summarize feed requirements, purchasing prices, and estimated feed procurement expenditures for each farm. The quantitative data support the qualitative findings by providing numerical comparisons of the observed business conditions. This approach allows the study to examine the market potential and operational considerations of a shrimp feed distribution business based on the empirical information available.

The research was conducted on Bengkalis Island, Bengkalis Regency, Riau Province, involving five vannamei shrimp farming businesses: CV Ketam Putih Abadi Jaya, CV Bina Usaha, Tambak Amir Syarifuddin, Tambak Vincent Kho, and PT Genesis Kembong Jaya. The five farms were selected using purposive sampling because they actively engaged in vannamei shrimp cultivation and could provide relevant information regarding pond conditions, production volume, feed requirements, feed purchasing prices, and operational activities. Purposive sampling enables researchers to select participants or research subjects based on specific characteristics and their relevance to the research objectives (Memon et al., 2025). The selection was based on the relevance of each farm to the research objectives and the availability of information required for the analysis. Therefore, the selected farms were not intended to statistically represent all shrimp farming businesses on Bengkalis Island.

The research involved five main informants, with one technician representing each of the five shrimp farming businesses. The informants were Bani from CV Ketam Putih Abadi Jaya, Taufik Hidayat from CV Bina Usaha, Suparno from Tambak Amir Syarifuddin, Muhammad Irawadi from Tambak Vincent Kho, and Dodo from PT Genesis Kembong Jaya. They were selected based on their involvement in daily shrimp farming operations and their practical knowledge of feed requirements, feed usage, purchasing prices, and procurement practices. The selection of key informants is important in qualitative research because they can provide relevant insights and contextual information based on their knowledge and experience of the research subject (Pahwa

et al., 2023). Their information was used to describe the operational conditions and feed procurement patterns of the respective farms.

Primary data were collected through interviews, direct field observations, and documentation. Interviews, observations, and document analysis are commonly used data collection methods in qualitative research to obtain information from participants, observed conditions, and supporting records (Chand, 2025). The interview questions covered several topics, including farm characteristics, pond area and number of ponds, production volume per cultivation cycle, feed requirements, feed brands, purchasing prices, procurement channels, operational activities, employment, and information concerning permits and environmental management. Direct observations were conducted at the shrimp farming locations to examine visible operational conditions, including ponds, supporting facilities, and water or waste management practices where observable. Documentation included interview records, field photographs, available feed price lists, and the official list of vannamei shrimp farming businesses for 2026.

Data collection was conducted from September to October 2026. Secondary data were obtained from relevant scientific publications, statistical publications, and available supporting documents. The legal and environmental aspects were examined descriptively based on information provided by the informants and direct field observations. No specific regional regulations or other legal documents were used as primary assessment materials in this study. Therefore, the legal and environmental analysis was limited to the information obtained during interviews and the conditions observed at the shrimp farming locations, rather than a formal assessment of regulatory compliance.

Data triangulation was conducted by comparing information obtained from interviews with the results of direct observations and available documentary evidence. Triangulation involves the use of multiple sources or methods to examine information and strengthen the credibility of qualitative research findings (Donkoh, 2023). Interview statements concerning feed requirements, purchasing prices, and procurement channels were compared with available records and supporting documents. Observations were used to examine visible conditions at the farm locations, while documentation provided additional evidence to support or clarify the interview findings. When information from different sources was inconsistent or could not be verified, the differences were recorded and interpreted cautiously rather than treated as confirmed facts.

Qualitative data were analyzed descriptively through data organization, categorization, comparison, and interpretation. This process involves systematically organizing and examining qualitative data to develop meaningful findings from the collected information (Bingham, 2023). Interview findings, observation notes, and documentary information were grouped into five business feasibility aspects: market; technical and operational; management and human resources; legal and environmental; and financial and investment. Similarities, differences, operational constraints, and potential opportunities among the five farms were then examined. The analysis focused on describing the empirical conditions of the research subjects rather than making statistical generalizations.

Quantitative data were processed using simple descriptive calculations to summarize feed requirements per cultivation cycle, purchasing prices per kilogram, and estimated feed procurement expenditures for each farm. Feed quantities were standardized into kilograms or tons to facilitate comparison. Estimated feed procurement expenditures were calculated by multiplying the feed quantity required per cycle, expressed in kilograms, by the corresponding purchasing price per kilogram. The results were presented in tables and charts to describe differences in feed requirements and purchasing expenditures among the five farms. These calculations represent estimated feed purchasing expenditures at the farm level and should not be interpreted as distributor revenue, net profit, or a complete financial feasibility assessment.

3. RESULTS AND DISCUSSION

3.1. Results

The results of this study are based on data collected through interviews, direct field observations, and documentation involving five active Pacific white shrimp (Litopenaeus vannamei) farming businesses on Bengkalis Island, Bengkalis Regency, Riau Province. The five businesses consist of CV Ketam Putih Abadi Jaya, CV Bina Usaha, Tambak Amir Syarifuddin, Tambak Vincent Kho, and PT Genesis Kembong Jaya. The collected data cover farm characteristics, production volume, cultivation cycles, feed requirements, purchasing prices, estimated feed procurement expenditures, feed brands, and procurement channels.

The collected data were analyzed descriptively by comparing the operational characteristics and feed procurement conditions of the five farming businesses. Numerical data were summarized using simple descriptive calculations to identify differences in production volume, feed requirements, purchasing prices, and estimated feed expenditures. Descriptive statistical analysis is used to organize, summarize, and interpret quantitative data to facilitate the identification and comparison of relevant patterns within a dataset (Kotronoulas et al., 2023). The results are presented in tables and figures to facilitate comparison among the research subjects.

To maintain data accuracy and transparency, this study distinguishes between information directly obtained from informants and figures derived through calculations based on the available data. In particular,

estimated feed requirements are identified as calculated values when they are derived from production volume and the feed conversion ratio, rather than directly reported purchasing records. This distinction is important because the completeness of the available information varies among the five farming businesses. Clear presentation and interpretation of quantitative data are important to ensure that reported findings accurately reflect the available data and the procedures used in their analysis (Slater & Hasson, 2025).

The results are organized into several aspects, covering the characteristics of the shrimp farming businesses, production volume and feed requirements, feed prices and procurement channels, and the implications of these findings for the potential development of shrimp feed distribution on Bengkalis Island.

3.1.1. Analysis of the Characteristics of Five Vannamei Shrimp Farming Businesses

Harvest production and annual cultivation cycles are among the characteristics used to describe the operational activities of the five vannamei shrimp farming businesses. These characteristics provide an overview of the production capacity of each farm and the frequency of cultivation activities within one year. The harvest production volume and annual cultivation cycle frequency of each farm are presented in Table 1.

Table 1. Characteristics of The Five Vannamei Shrimp Farming Businesses in Bengkalis and Bantan Subdistricts, Bengkalis Regency

Name of Shrimp Farming Business	Location	Total Land Area Managed by the Shrimp Farming Business	Number of Production Ponds	Total Production Pond Area
CV. Ketam Putih Abadi Jaya	Desa Air Putih, Kecamatan Bengkalis	2 ha	10 ponds	12.000 m² (1,2 ha)
CV. Bina Usaha	Desa Senggoro, Kecamatan Bengkalis	4,75 ha	14 ponds	27.400 m² (2,74 ha)
Amir Syarifuddin	Desa Damai, Kecamatan Bengkalis	4,50 ha	14 ponds	8.000 m² (0,80 ha)
Vincent Kho	Desa Penampi, Kecamatan Bengkalis	21 ha	12 ponds	25.500 m² (2,55 ha)
PT. Genesis Kembong Jaya	Kembung Luar, Kecamatan Bantan	32 ha	26 ponds	56.700 m² (5,67 ha)

Source: Processed Research Data (2026).

3.1.2. Analysis of Research Informants Characteristics

The characteristics of the research informants are presented to identify the individuals who provided information during the data collection process. The study involved five informants, each representing one of the five vannamei shrimp farming businesses investigated. The informants were technicians who provided information regarding the operational activities of their respective farms. Their names and the locations of the farming businesses are presented in Table 2.

Table 2. Characteristics of Research Informants from Five Vannamei Shrimp Farming Businesses

Shrimp Farming Business	Name of Informants (Technician)	Location of Shrimp Farming Business
CV. Ketam Putih Abadi Jaya	Bani	Jl. Panglima Minal, Desa Air Putih, Kec. Bengkalis, Kab. Bengkalis, Provinsi Riau
CV. Bina Usaha	Taufik Hidayat	Jl. Panglima Minal, Desa Senggoro, Kec. Bengkalis
Amir Syarifuddin	Suparno	Gg. Manggis Desa Damai Kec. Bengkalis Kab. Bengkalis
Vincent Kho	Muhammad Irawadi	Jl. H. Ismail RT 05 RW 04 Dusun Penampi Desa Penampi Kec. Bengkalis Kab. Bengkalis
PT. Genesis Kembong Jaya	Dodo	Jl. Nelayan no 1. Paret Lapis, Desa Kembung Luar Kec. Bantan Kab. Bengkalis Provinsi Riau

Source: Processed Research Data (2026).

3.1.3. Analysis of Production Data and Harvest Cycles

Production data and harvest cycles provide an overview of the production capacity and operational activities of the five vannamei shrimp farming businesses. The data include the number of production ponds, production volume per harvest cycle, and the number of harvest cycles conducted annually. These indicators are presented in Table 3.

Table 3. Production Data and Harvest Cycles of Five Vannamei Shrimp Farming Business

Shrimp Farming Business	Number of Production Ponds	Production per Harvest Cycle	Harvest Cycles per Year
CV. Ketam Putih Abadi Jaya	10 ponds	30-35 tons	2
CV. Bina Usaha	14 ponds	50 tons	2
Amir Syarifuddin	14 ponds	18 tons	2
Vincent Kho	12 ponds	48 tons	2
PT. Genesis Kembong Jaya	26 ponds	104-156 tons	2

Source: Processed Research Data (2026).

3.1.4. Analysis of Vannamei Shrimp Feed Requirements

In addition to production data and harvest cycles, feed requirements and estimated feed procurement costs are important indicators for understanding the operational needs of the five vannamei shrimp farming businesses. The feed requirements, brands, procurement sources, and purchasing prices were identified through interviews with the farm informants. Estimated feed costs were calculated by multiplying the feed requirements in kilograms by the reported purchase price per kilogram. The comparison of feed requirements and estimated feed costs per harvest cycle is presented in Table 4.

Table 4. Feed Requirements and Estimated Feed Costs per Harvest Cycle

Shrimp Farming Business	Number of Production Ponds	Feed Brand	Feed Procurement Source	Feed Requirements per Harvest Cycle	Feed Price per Kilogram	Estimated Feed Cost per Harvest Cycle
CV. Ketam Putih Abadi Jaya	10 Ponds	Haida	PT Haida Agriculture Indonesia	60 tons	Rp17,500/kg	Rp1,050,000,000
CV. Bina Usaha	14 Ponds	STP, Gold Coin	Medan, Lampung	85 tons	Rp17,800/kg	Rp1,513,000,000
Amir Syarifuddin	14 Ponds	Ecobest	Dumai	25 tons	Rp17,000-Rp18,000/kg	Rp425,000,000-Rp450,000,000
Vincent Kho	12 Ponds	Novo	Bengkalis Agent	72-96 tons	Rp18,280-Rp19,480/kg	Rp1,316,160,000-Rp1,870,080,000
PT. Genesis Kembong Jaya	26 Ponds	Novo, Irawan	PT CP Prima Medan	161.2-249.6 tons	Rp18,400/kg	Rp2,966,080,000-Rp4,592,640,000

Source: Processed Research Data (2026).

3.2. Discussion

The findings of this study indicate that feed requirements among the five vannamei shrimp (Litopenaeus vannamei) farming businesses on Bengkalis Island are relatively substantial, ranging from 25 to 249.6 tons per harvest cycle. These differences indicate variations in feed absorption capacity among the farming businesses. In addition, all five businesses conduct two harvest cycles per year. This condition provides an initial overview of recurring feed requirements and market opportunities for vannamei shrimp feed distribution. Furthermore, if all shrimp farming businesses operating on Bengkalis Island are taken into consideration, the overall feed demand may be greater than the demand identified from the five research subjects. Therefore, the feed requirements of these five businesses can serve as an initial basis for identifying potential customers and opportunities for developing a feed distribution business.

This potential can be further analyzed through five business feasibility aspects: market, technical and operational, management and human resources, environmental and legal, and financial and investment aspects. From the market aspect, variations in feed requirements, purchasing prices, brand preferences, and procurement sources indicate different customer needs that can become potential targets for a distribution business. These findings are also related to the study by (Rosa et al., 2026), which employed Porter's Five Forces framework to analyze the development of the shrimp industry in Bengkalis Regency. This approach provides an overview of the importance of considering business competition, supplier bargaining power, and consumer bargaining power in determining a business's market position. In the context of this study, information regarding feed requirements and procurement channels from the five shrimp farming businesses can serve as an initial consideration for identifying potential customer characteristics and the competitive conditions of the feed distribution market.

The differences in feed purchasing prices are also associated with the brands and procurement sources used by each shrimp farming business. The reported prices range from IDR 17,000 to IDR 19,480 per kilogram. CV Ketam Putih Abadi Jaya uses Haida feed at IDR 17,500 per kilogram, while CV Bina Usaha uses STP and Gold Coin feed at an average reported price of IDR 17,800 per kilogram. Amir Syarifuddin uses Ecobest feed, with prices ranging from IDR 17,000 to IDR 18,000 per kilogram. Meanwhile, Vincent Kho uses Novo feed at prices ranging from IDR 18,280 to IDR 19,480 per kilogram, and PT Genesis Kembong Jaya uses Novo and Irawan feed at IDR 18,400 per kilogram. These variations indicate that feed purchasing patterns differ among the five businesses in terms of brand selection, purchasing prices, and procurement sources. For a prospective distributor, this information is important when determining the types of feed products to be supplied, identifying potential supplier relationships, and considering competitive selling prices. However, the reported farm-level purchasing prices cannot automatically be used as distributor selling-price benchmarks without considering supplier purchase prices and distribution costs.

From the technical and operational aspect, differences in feed requirement volumes and procurement sources indicate the importance of inventory planning, storage, and delivery systems that correspond to each customer's needs. Bjelland et al (2025), through their study of maritime inventory routing, provide an operational perspective on inventory management and sea transportation routes within distribution systems. This is relevant to the feed procurement conditions of the observed farms, which obtain supplies from Medan, Lampung, Dumai, and Bengkalis. Therefore, selecting procurement routes and managing inventory should be considered when planning distribution activities. Meanwhile, from the management and human resources aspect, business operations need to consider task allocation, workforce management, customer service, and coordination with suppliers to ensure that distribution activities are properly organized.

Furthermore, the environmental and legal aspects are related to fulfilling business licensing requirements and managing environmental conditions associated with feed storage and distribution activities. These aspects need to be considered to ensure that business operations comply with applicable requirements and the environmental conditions of the operational location. Meanwhile, the financial and investment aspects involve planning initial capital, feed purchasing prices from suppliers, transportation costs, storage expenses, labor requirements, and projected revenue and cash flows. The study by Nuriansyah & Maulana (2023), which examined the financial feasibility of vannamei shrimp farming using plastic-lined ponds in Teluk Pambang, provides regional context regarding the financial aspects of shrimp farming businesses in Bengkalis. Similarly, Sitti Zaenab Agustina et al (2025) discussed the financial aspects of intensive vannamei shrimp farming systems. These studies can serve as supporting references for understanding cost and investment requirements in the aquaculture sector, although their research subjects differ from those of a shrimp feed distribution business.

In addition, Maulana & Dwiyanti (2025) and Andriani & Pratama (2023) provide studies related to feed management in shrimp farming activities. These studies strengthen the understanding that feed availability is an important component in supporting farm production activities. In the distribution context, this condition highlights the importance of supplying feed according to customer preferences and requirements, as well as ensuring timely delivery. However, the present study focuses on feed requirements, purchasing prices, brand preferences, and procurement channels. It does not directly measure the biological performance of feed, such as the Feed Conversion Ratio (FCR), shrimp growth, or the nutritional effectiveness of individual feed brands.

Based on these five aspects, the findings provide an initial overview indicating that vannamei shrimp feed distribution on Bengkalis Island has market potential that deserves further consideration. This potential is reflected in the substantial feed requirements of the five farming businesses examined, recurring demand based on harvest cycles, and variations in feed brands and procurement sources used by the farmers. The market potential may also be greater if all shrimp farming businesses on Bengkalis Island are taken into consideration.

Therefore, the findings should not be interpreted as indicating that a feed distribution business is unfeasible. Instead, they indicate opportunities that can be developed by considering the market, technical and operational, management and human resources, environmental and legal, and financial and investment aspects. Additional data regarding suppliers, purchasing prices, transportation costs, warehouse requirements, labor, initial capital, and projected cash flows are necessary to strengthen the financial feasibility assessment. Thus, this study can serve as an initial basis for identifying market potential and preparing development plans for a vannamei shrimp feed distribution business on Bengkalis Island.

4. CONCLUSION

This study provides an initial overview of the market potential for vannamei shrimp (Litopenaeus vannamei) feed distribution on Bengkalis Island, Riau Province, based on data from five shrimp farming businesses. The identified feed requirements ranged from 25 to 249.6 tons per harvest cycle, with reported purchasing prices ranging from IDR 17,000 to IDR 19,480 per kilogram. All five farming businesses reported conducting two harvest cycles per year, indicating recurring feed requirements among the observed farms.

The findings also reveal variations in feed brands and procurement sources. Feed supplies are obtained through distribution networks originating from Medan, Lampung, Dumai, and Bengkalis. These findings provide an

initial understanding of existing procurement patterns and customer needs that may be considered in developing a local feed distribution business.

Based on the research findings, vannamei shrimp feed distribution on Bengkalis Island has market potential that deserves further consideration. This potential is reflected in the substantial feed requirements of the five farming businesses examined, recurring demand based on harvest cycles, and variations in feed brands and procurement sources. The market potential may also be greater if all shrimp farming businesses operating on Bengkalis Island are taken into consideration. However, this study cannot yet establish the financial feasibility or investment profitability of a feed distribution business due to limited data regarding initial capital, supplier purchasing prices, transportation costs, warehouse requirements, labor, sales projections, and cash flows. Therefore, the findings are more appropriately regarded as an initial basis for identifying market potential and opportunities for developing a vannamei shrimp feed distribution business on Bengkalis Island.

Future research is recommended to expand the scope of respondents by involving feed manufacturers, distributors, agents, and a larger number of shrimp farming businesses across Bengkalis Island. More comprehensive data collection regarding supplier purchasing prices, transportation costs, storage, labor, initial capital, and projected cash flows is necessary to provide a more complete overview of the distribution business. Furthermore, financial feasibility analysis can be conducted using the Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period methods. Thus, future research is expected to provide a more comprehensive assessment of the development opportunities and investment feasibility of a vannamei shrimp feed distribution business on Bengkalis Island.

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