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RESEARCH ARTICLE

IMPROVING THE QUALITY OF PADDY AND PRICING ISSUES THROUGH PROCESS OPTIMIZATION IN A RICE COMPANY

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ABSTRACT - This research aims to improve the quality of paddy and address pricing issues through process optimization in APRM. The study focuses on identifying the manufacturing process of paddy, optimizing it to enhance quality, and suggesting procurement practices to resolve pricing issues. The research employed a semi-structured interview approach to collect data. The findings provide valuable recommendations for APRM to optimize the manufacturing process, improve paddy quality, and establish fair pricing structures. The significance of the study lies in its potential to enhance APRM's market competitiveness, improve farmer welfare, promote sustainability, contribute to the agricultural industry's advancement, and influence policy and decision-making. The research concludes with a discussion, highlighting the research's implications, addressing gaps in the literature, and offering recommendations for future research. Implementing the suggested strategies can lead to improved paddy quality, stable pricing, and overall growth for APRM and the agricultural sector. By implementing the suggested strategies, APRM has the opportunity to achieve improved paddy quality, stable pricing, and overall growth, thereby positioning itself as a leading player in the rice industry.

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1.0 INTRODUCTION

Rice is an important agricultural crop grown worldwide and plays an important role in ensuring food security for the world's population. Rice is used to make rice, the staple food for more than half of the world's population. However, only 7% of rice production from the country of origin is sent to export markets (Rice Almanac, 2013). Rice and paddy fields therefore play a central role in food security, socio-cultural and strategic government interventions in many developing countries (Omar et al., 2019; Shah et al., 2019). Commodities such as rice are perishable materials that require quick and precise handling. Improper handling leads to loss of high-quality, quantitative results. This can be detrimental as it affects farmers' income (Aprillya et al., 2019). In recent years, there has been a growing demand for high-quality paddy, and the pricing of the crop has become a critical issue for many companies. Therefore, it is essential to ensure that the quality of paddy is maintained, and the pricing issue is adequately addressed to guarantee sustainable production.

Rice holds immense significance in Malaysia's agricultural landscape, economy, and food culture. Rice is the staple food of Malaysians and an important part of daily diet. It serves as the main source of carbohydrates and essential nutrients and plays an important role in meeting the nutritional needs of the population. Securing an adequate and stable supply of rice is crucial for Malaysia's food security as its population grows rapidly (FAO, 2020). Rice cultivation and production contribute significantly to Malaysia's agricultural sector and overall economic development. The rice industry provides employment opportunities, generates income, and reduces poverty, especially in rural areas. In addition, rice cultivation supports various ancillary industries such as seed production, engineering and transportation, stimulating economic growth (Aziz et al., 2018). Rice farming has deep cultural roots in Malaysia and reflects the country's rich heritage and traditions. It plays a central role in local cuisine, festivals, and social gatherings. Rice-based dishes such as nasi lemak and nasi kerabu are an integral part of Malaysian culinary identity. Preserving rice cultivation and traditional agricultural practices can help preserve cultural heritage and promote a sense of national identity (Chen et al., 2020). Rice cultivation in Malaysia has the potential to contribute to environmental sustainability through good land and water management practices. Traditional rice farming methods, such as the System of Rice Reinforcement (SRI), focus on organic farming, reduced water use, and the use of natural fertilizers. Implementing sustainable rice production techniques can minimize the environmental impact of rice cultivation, conserve water resources, and protect biodiversity (Lau et al., 2019). Rice is of great importance in Malaysia, covering aspects of food security, economic development, cultural heritage, and environmental sustainability. Recognizing the value of rice production is critical to ensuring a stable food supply, promoting rural development, preserving cultural traditions and adopting sustainable agricultural practices. For governments, policy makers and stakeholders, supporting and investing in the rice industry is essential to realizing its potential benefits and sustaining the agricultural sector for future generations.

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The cultivation of rice in Malaysia offers numerous benefits, ranging from economic stability and employment opportunities to environmental sustainability. The rice industry contributes significantly to Malaysia's economy. Research by Basri et al. (2019) reveals that rice production and related activities generate employment opportunities, stimulate rural economies, and contribute to the overall Gross Domestic Product (GDP). Malaysia has the potential to export rice to neighboring countries. According to the Malaysian Agricultural Research and Development Institute (MARDI) (2021), advancements in rice production technology and quality improvement have positioned Malaysia as a potential rice-exporting country, enhancing trade opportunities and foreign exchange earnings. Rice cultivation in Malaysia often utilizes efficient irrigation techniques, such as the System of Rice Intensification (SRI). SRI reduces water usage while maintaining or even improving crop yield. Research by Ismail et al. (2018) highlights that SRI practices have shown a reduction in water consumption by up to 30%, contributing to sustainable water management. Paddy fields provide habitats for various aquatic organisms, birds, and insects, thereby promoting biodiversity. A study by Samad et al. (2017) emphasizes that rice cultivation plays a crucial role in preserving wetland ecosystems, protecting endangered species, and maintaining overall ecological balance. Paddy fields possess the ability to sequester carbon dioxide, a significant greenhouse gas contributing to climate change. Research conducted by Azmi et al. (2021) demonstrates that rice cultivation practices, such as intermittent flooding and organic farming, can enhance carbon sequestration potential, making paddy fields a valuable tool in climate change mitigation. The cultivation of rice in Malaysia offers a wide range of benefits, both economically and environmentally. The economic advantages include food security, employment generation, and export potential, contributing to the country's overall development. Additionally, rice cultivation promotes environmental sustainability by conserving water, preserving biodiversity, and aiding in carbon sequestration. These research-backed benefits emphasize the significance of rice farming in Malaysia, warranting continued support and investment in the sector.

Malaysian rice crops consist of medium-sized plots of less than 2 hectares with about 194,000 farmers (Najim et al., 2007; Terano & Mohamed, 2011) and can be distinguished as smallholder agriculture (Ministry of Agriculture, 2018). Small areas lead to low productivity and high production costs (Samberg et al., 2016). Lack of economies of scale means the country is at a relative disadvantage in achieving her 100% self-sufficiency (SSL) level. Malaysia has eight major rice reserves and is considered the country of rice and food security in the country. Under the National Agricultural Policy (NAP) 1984-1991, major planted areas were intentionally set aside as designated wetland rice growing areas (Malaysia Government, 1984). This can be seen as a strategic intervention to support the development of the rice and paddy sectors and safeguard the country's food security. Rice farmers are based in these main growing areas, but other small paddy fields are also scattered across the country (Fahmi et al., 2013). In order to alleviate poverty and improve the living conditions of rice farmers, various subsidies have been established in the breadbasket. The average yield per hectare in these areas was 4.47 m/ha (see Table 1), higher than the national average yield of 4.03 m/ha in 2017. Relatively four of the eight breadbaskets (MADA, KETARA, IADA Pulau Pinang, and Barat Laut Selangor) had above average cereal productivity per hectare. However, when compared with other rice-producing countries in Southeast Asia, the average productivity of these breadbaskets ranks third after Vietnam and Indonesia (see Table 2). Still, it is important to mention that Malaysia's total rice planted area is about 700,000 hectares, the lowest in Southeast Asia. The region's three largest rice producers, namely Indonesia, Vietnam and Thailand, have allocated 11.5 million hectares, 7.54 million hectares and 10.83 million hectares, respectively (United States Department of Agriculture [USDA], 2020).

Table 1. Total paddy production and productivity of the granary areas in 2017

Main granary areas	State	Total production (mt)	Productivity (mt/ha)
Muda Agriculture Development Authority (MADA)	Kedah	974,387	4.841
Kedah Agricultural Development Authority (KADA)	Kelantan	240,490	4.448
Integrated Agricultural Development Area (IADA) KETARA	Terengganu	50,438	5.172
IADA Pulau Pinang	Pulau Pinang	146,660	5.737
IADA Barat Laut Selangor	Selangor	165,571	4.510
IADA Kerian	Perak	171,237	4.087
IADA Kemasin Samarak	Kelantan	26,938	3.779
IADA Seberang Perak	Perak	88,198	3.180
Total		1,863,919	-
Average		232,990	4.469

Source: Department of Agriculture (2019)

Table 2. Paddy productivity of selected countries in Southeast Asia in 2017

Country	Productivity (mt/ha)
Malaysia (eight granary areas)	4.47
Vietnam	5.89
Indonesia	4.76
Myanmar	2.91
Philippines	4.02
Laos	3.24
Cambodia	2.78
Thailand	2.89
Brunei	2.00

Source: IRRI World Rice Statistics Online Query Facility (2019)

Government concerns over high production costs may be the reason for the particularly low targets and success rates. The government found it cheaper to import a certain amount of rice than to rely on local production. Limited arable land and attractive international markets are also key factors behind the country's rice imports. However, in the 11th Malaysia Plan, the government reset his SSL target for rice to 100%. Several strategies have been developed and implemented to achieve specific self-sufficiency goals.

Table 3. Malaysia's rice self-sufficiency level (SSL)

Plan period	Self sufficiency level (%)
First Malaysia Plan (1966–1970)	80.0
Second Malaysia Plan (1971–1975)	87.0
Third Malaysia Plan (1976–1980)	92.0
Fourth Malaysia Plan (1981–1985)	76.5
Fifth Malaysia Plan (1986–1990)	75.0
Sixth Malaysia Plan (1991–1995)	76.3
Seventh Malaysia Plan (1996–2000)	71.0
Eight Malaysia Plan (2001–2005)	71.0
Ninth Malaysia Plan (2006–2010)	72.0
Tenth Malaysia Plan (2011–2015)	71.4
Eleventh Malaysia Plan (2016–2020)	100.0

Source: Arshad et al. (2010), Economic Planning Unit (2015)

These tactics have been formalised in Malaysia's five-year plan to meet specific goals for rice self-sufficiency, as indicated in Table 3. Food security has become a more crucial issue as a result of the 2008 financial crisis, which was aggravated by the fuel crisis and related to the food crisis. The 2008 food crisis has forced a reevaluation and reorganisation of current and upcoming economic policies, which may prioritise the growth of the agricultural sector, particularly the food subsector. Therefore, as part of the 10th Malaysia Plan, the government would prioritise enhancing infrastructure development and research and development to boost travel revenues over the SSL objective of 70%. Additionally, to replace the National Agriculture Policy, the government adopted the 10-year National Agriculture and Food Policy in 2010. The main goals of the new policies are to boost farmer and agribusiness incomes and ensure national food security. Without a doubt, these initiatives are crucial for the modernization and growth of the paddy and rice industries. However, the challenge of continuing output growth and guaranteeing long-term food security will be made more difficult by the negative effects of climate change.

Malaysia is renowned for its diverse culinary traditions, and one of the staples that play a crucial role in its cuisine is rice. The country boasts a range of top companies and brands that have established as leaders in the rice industry. One prominent name is Bernas, the national rice company of Malaysia. Bernas is responsible for the importation, storage, packaging, and distribution of rice across the nation, ensuring a steady supply of this essential grain. The commitment to quality and reliability of this brand has made it a trusted choice in Malaysian households. In addition to Bernas, another notable company is Jasmine Food Corporation. Jasmine Food is recognized for producing high-quality rice products, including fragrant Jasmine rice, which is widely cherished for its delicate aroma and fluffy texture. The brand has gained popularity both locally and internationally, catering to the discerning tastes of rice lovers. When it comes to the types of rice available in Malaysia, Basmati rice is highly regarded for its long grains and distinct fragrance. It is often used in biryanis, pilafs, and other flavorful rice dishes. Brands such as Daawat and India Gate are popular choices for Basmati

rice, offering consistent quality and authenticity. On the other hand, local rice varieties hold a special place in Malaysian cuisine. Bario Rice, cultivated in the highlands of Sarawak, is known for its unique flavor and texture. This heirloom rice variety is grown using traditional methods and is cherished for its nutritional value and cultural significance.

To sum up, the rice industry in Malaysia is supported by top companies and brands such as Bernas and Jasmine Food Corporation. These companies ensure the availability of high-quality rice products, including the fragrant Jasmine rice. Moreover, the market offers a variety of rice types, including Basmati rice from brands like Daawat and India Gate, as well as local treasures like Bario Rice from Sarawak. These diverse options cater to the diverse culinary needs and preferences of Malaysians, cementing rice's position as a staple in the country's vibrant food culture.

1.1 Research Problem

The study addresses a significant research problem focused on improving the quality of paddy and resolving pricing issues within a rice company through process optimization. The research aims to identify and understand the key factors that have contributed to the decline in paddy quality and the emergence of pricing challenges that the company, APRM, has been experiencing in recent years. The degradation in paddy quality has had severe consequences for the company, resulting in decreased yields and diminished profitability. This decline can be attributed to various factors such as inadequate farming practices, improper storage and handling techniques, and suboptimal processing methods. By comprehensively examining these factors, the study seeks to shed light on the underlying causes of the quality deterioration.

Moreover, the pricing issues have caused significant tensions and conflicts between the rice company and farmers, leading to a breakdown in trust and cooperation. The current pricing mechanisms might lack transparency, fairness, and efficiency, exacerbating the strained relationship between the two parties. Understanding and addressing these pricing challenges is essential for fostering a collaborative environment and maintaining a sustainable partnership that benefits both the company and the farmers. To tackle these pressing issues, the research problem aims to explore how process optimization techniques can effectively enhance the quality of paddy and mitigate the pricing challenges faced by the company. By optimizing the various stages of the production process, including farming, harvesting, storage, and processing, the study intends to identify strategies that can improve paddy quality, increase yields, and enhance overall profitability for the company. Furthermore, the research problem recognizes the need to align process optimization efforts with the goal of maximizing customer satisfaction. A key aspect of achieving this objective involves producing high-quality rice products that meet consumer expectations in terms of taste, texture, appearance, and nutritional value. By employing process optimization techniques, the study aims to develop methods and protocols that not only enhance paddy quality but also contribute to the creation of premium rice products that resonate with customer preferences.

In summary, the research problem at hand encompasses the improvement of paddy quality and resolution of pricing issues within a rice company through process optimization. By identifying the factors contributing to the decline in paddy quality and addressing the challenges in pricing mechanisms, the study aims to maximize profitability, restore trust and cooperation between the company and farmers, and ultimately meet customer demands for high-quality rice products in the rice industry.

1.2 Research Gap

Quantifying the relationship between process optimization and paddy quality is an essential aspect of improving rice production. Despite the recognition that process optimization positively impacts quality, there is a need for comprehensive studies that qualitatively analyze how specific optimization techniques directly influence various paddy quality attributes. These attributes include grain size, texture, cooking characteristics, and nutritional content. The lack of such research contributes to a gap in understanding the precise correlation between process optimization measures and the resulting improvement in paddy quality.

Additionally, evaluating the economic implications of improved paddy quality is crucial for rice companies. While enhancing rice quality is desirable, it is essential to assess the economic benefits and costs associated with implementing process optimization measures. Research in this area is limited, and investigating factors such as the market value of high-quality rice, potential price premiums, increased market demand, and the cost-effectiveness of process optimization techniques can provide valuable insights into the financial feasibility and potential returns on investment for rice companies.

Furthermore, identifying barriers and challenges in implementing process optimization is vital for successful adoption. Research gaps exist in understanding the specific obstacles that rice companies may encounter when implementing process optimization practices. These barriers can include technological limitations, financial constraints, lack of knowledge or awareness, and resistance to change. Exploring these challenges and finding strategies to overcome these obstacles can facilitate the widespread adoption of process optimization, leading to improved paddy quality and pricing outcomes in the rice industry.

1.3 Research Questions

1) What are the specific steps and stages involved in the manufacturing process of paddy in APRM?
2) What are the potential areas for process optimization to improve the quality of paddy in APRM?

3) What is the best procurement process that APRM can adopt to address the pricing issue?

1.4 Research Objectives

1) To identify the manufacturing process of paddy in APRM.
2) To improve the quality of paddy through process optimization in APRM.
3) To suggest the best procurement practices for APRM in solving pricing issues.

1.5 Scope of Study

This research aims to enhance the quality of paddy and resolve pricing concerns in APRM through process optimization. The study is focused on investigating how paddy is manufactured within APRM. Identifying process optimization areas and proposing pricing strategies are aimed at improving paddy quality. The quality of paddy could be improved by recognizing potential areas for applying process optimization techniques through an assessment of the existing procedures.

Moreover, the investigation will explore the pricing obstacles confronted by APRM. The poor quality of paddy from suppliers caused inconsistency in procurement. The elements contributing to this pricing issue will be explored. A more uniform and just pricing structure for both the company and farmers will be suggested through various strategies. Data will be gathered via semi-structured interviews. The study's range is restricted to APRM and its operations, with attention given to the specific struggles corresponding to the quality of paddy and pricing issues. The study will not extensively explore broader market dynamics or external factors influencing the paddy industry.

The expected timeline for conducting this research is dependent on data availability and chosen methodology which is through interview. The presentation of the study findings will be done through an extensive report. Implementation of process optimization techniques and pricing strategies recommended in the report can help APRM enhance the quality of paddy and resolve pricing issues effectively.

1.6 Significance of Study

This research holds several significant advantages, primarily in enhancing the quality of paddy harvested by the rice company (APRM). By implementing streamlined procedures such as improved drying methods, storage practices, and quality monitoring, APRM can ensure uniform and superior quality paddy. This directly impacts the company's reputation and market competitiveness, leading to increased profitability and customer satisfaction. Moreover, the research aims to improve farmer welfare by introducing a sustainable and fair pricing structure, providing better compensation to farmers. This enhancement in pricing policies considers the perspectives of both APRM and farmers, fostering a mutually beneficial partnership.

The potential impact of this study extends beyond APRM and the farmers it works with. The empirical evidence and practical insights gained from the research can contribute to advancing the larger agricultural industry. Other paddy companies can benefit from the experiences and successful strategies identified in process optimization and pricing models, leading to improved industry standards and overall progress in the sector. Consequently, this study has the potential to inspire better quality standards and more efficient pricing mechanisms throughout the agricultural industry.

Furthermore, this research makes a valuable academic contribution by expanding the existing knowledge base on improving paddy quality and addressing pricing concerns. Agricultural management specialists, researchers in supply chain optimization or pricing strategies, as well as students and academics, will find this study to be an invaluable resource. It enriches the ongoing discourse in the field and provides a valuable learning tool for those interested in enhancing quality and pricing dynamics in the paddy industry.

1.7 The Case Company

APRM is a prominent company operating in the paddy industry in a small town located in the state of Pokok Sena, Kedah, Malaysia and 100% owned by natives. APRM was founded in the year 1991 and has grown to become a key player in the Malaysian rice industry. With a rich history spanning several decades, the company has consistently strived to deliver premium quality rice products to consumers across the nation. The company operates a state-of-the-art rice mill, equipped with advanced machinery and technologies, to ensure efficient processing and packaging of rice products. With a skilled workforce and streamlined operations, APRM maintains its position as a reliable and efficient rice producer. APRM offers a diverse range of rice varieties to cater to the preferences of its customers.

The company specializes in producing high-quality rice, including fragrant Jasmine rice, long-grain Basmati rice, and local rice varieties. Through meticulous selection of paddy, rigorous quality control processes, and modern milling techniques, APRM ensures that its products meet the highest standards of taste, texture, and nutritional value. APRM has successfully established a strong market presence in Malaysia and beyond. The company supplies its rice products to various distribution channels, including supermarkets, grocery stores, restaurants, and food service providers. Furthermore, APRM has obtained certifications that validate the halal status of its products, ensuring compliance with Islamic dietary requirements and meeting the expectations of Muslim consumers.

APRM is dedicated to delivering rice products of exceptional quality. The company adheres to strict quality control measures at every stage of the production process, from paddy selection to packaging, ensuring consistency and customer satisfaction. Moreover, APRM recognizes the importance of sustainability in the rice industry and integrates eco-friendly practices into its operations. The company promotes responsible farming methods, efficient resource utilization, and environmentally conscious packaging solutions to minimize its ecological footprint. It has established itself as a key player in the production and procurement of paddy, contributing significantly to the agricultural sector. With a strong focus on quality and customer satisfaction, APRM strives to meet market demands and maintain a competitive edge.

The company has several departments in the production process such as raw material preparation, production, quality control, packing, shipping, and sales. APRM always ensures that the quality of the manufactured products meets consumer standards and preferences. APRM also applies engineering techniques to the manufacturing of its products. These speeds up the manufacturing process and eliminates human error.

2.0 LITERATURE REVIEW

2.1 Manufacturing Process

The manufacturing process of paddy in the rice industry involves a series of steps that transform raw paddy into market-ready rice products. The first stage in the manufacturing process involves cleaning and pre-processing of paddy to remove impurities and foreign materials. According to Wang et al. (2019), paddy cleaning is crucial for improving the quality and safety of rice. Techniques such as mechanical cleaning, winnowing, and magnetic separation are commonly employed to remove stones, husks, and other debris from the paddy (Thompson et al., 2020). Parboiling is a significant step in the manufacturing process, particularly for certain rice varieties. Parboiling involves soaking the paddy in hot water, steaming, and drying before milling. This process improves the nutritional value, texture, and cooking characteristics of rice (Balasubramanian et al., 2021). Parboiling also enhances the gelatinization properties of rice, leading to improved milling and polishing outcomes (Fofana et al., 2018). Milling is a critical stage where the paddy is processed to remove the husk, bran, and germ layers, resulting in polished white rice. The milling process involves several steps, including hulling, whitening, and polishing. Research by Glatzle et al. (2017) highlights the importance of controlling milling parameters, such as degree of milling and polishing time, to achieve desired rice quality attributes such as appearance, texture, and head rice yield. After the milling process, sorting and grading are conducted to separate the rice grains based on size, shape, and color. Optical sorting machines are commonly used in this stage to identify and remove defective grains, foreign materials, and discolored rice (Ertugay et al., 2020). The sorting process ensures uniformity and enhances the overall quality of the final rice product. The final stage in the manufacturing process involves packaging and storage of the rice. Proper packaging materials and techniques are essential to maintain the quality, freshness, and shelf life of the rice (Sharma et al., 2019). Adequate storage conditions, including temperature and humidity control, are crucial to prevent spoilage, insect infestation, and moisture absorption (Salvi et al., 2021). The manufacturing process of paddy in the rice industry encompasses various stages, each contributing to the production of high-quality rice products. From cleaning and pre-processing to milling, sorting, packaging, and storage, every step plays a vital role in ensuring the desired quality, appearance, and nutritional value of rice. By understanding and optimizing each stage of the manufacturing process, rice companies can enhance product consistency, customer satisfaction, and market competitiveness.

2.2 Quality of Paddy

The quality of paddy plays a crucial role in the production of high-quality rice products. Paddy quality is of utmost importance as it directly impacts the final quality of rice products. Studies have shown that the quality of paddy affects various parameters, including grain appearance, nutritional value, milling efficiency, cooking characteristics, and consumer preference (Kaur et al., 2018; Yousaf et al., 2019). Therefore, understanding and optimizing paddy quality is essential for producing superior rice products that meet consumer expectations. Several factors contribute to the quality of paddy. One of the primary determinants is the variety or cultivar of paddy, which affects characteristics such as grain size, shape, and amylose content (Teng et al., 2018). Environmental factors, including climate, soil conditions, and cultivation practices, also influence paddy quality (Krishnaiah et al., 2019). Additionally, post-harvest handling, including drying, storage, and transportation, can significantly impact the quality of paddy grains (Mandal et al., 2020). Various methods are employed to assess the quality of paddy. Physical attributes such as grain size, shape, and color are commonly evaluated through visual inspection and measurement techniques (Kumar et al., 2021). Chemical analyses, including proximate composition, moisture content, amylose content, and grain quality parameters, provide further insights into paddy quality (Kaur et al., 2018). Additionally, sensory evaluation, including taste, aroma, and cooking characteristics, helps assess the overall consumer acceptability of rice derived from different paddy samples (Yousaf et al., 2019). Researchers have explored numerous approaches for enhancing the quality of paddy. Crop management practices, such as optimal fertilization, water management, and pest control, contribute to improved paddy quality (Choudhury et al., 2020). Post-harvest interventions, including proper drying methods, effective storage techniques, and appropriate milling processes, are critical for preserving paddy quality (Bhat et al., 2017). Advances in breeding techniques and the development of high-quality rice varieties also contribute to improved paddy quality (Kumar et al., 2021). Various factors, including cultivar selection, environmental conditions, and post-harvest practices, influence paddy quality. Assessment methods encompass physical, chemical, and sensory analyses to evaluate different quality parameters. To enhance paddy

quality, researchers recommend optimizing crop management practices, implementing proper post-harvest interventions, and developing improved rice varieties. Further research and collaboration among scientists, farmers, and the rice industry are essential to continually enhance paddy quality and meet consumer expectations for high-quality rice products.

2.3 Process Optimization

Process optimization plays a crucial role in enhancing operational efficiency, reducing costs, and improving overall performance in various industries. Process optimization involves the systematic improvement of processes to achieve higher efficiency, productivity, and quality. According to Silva and Hahn (2018), it encompasses the identification and elimination of bottlenecks, streamlining of workflows, and utilization of resources in the most effective manner. By optimizing processes, organizations can enhance competitive advantage and achieve better business outcomes. Various methodologies have been developed and applied for process optimization. One commonly used approach is Lean Six Sigma, which combines lean principles focused on waste reduction with statistical methods for process improvement (George, 2002). Another widely employed technique is the use of mathematical modeling and optimization algorithms to optimize process parameters and decision-making (Kohli & Singh, 2017). Process optimization offers several benefits to organizations. It leads to increased productivity and throughput, as highlighted by Pannek et al. (2019), who found that optimizing process parameters in a manufacturing setting resulted in significant productivity improvements. Moreover, process optimization can reduce costs by eliminating unnecessary steps, improving resource utilization, and minimizing waste (De Toni & Tonchia, 2001). This is supported by the study of Gopalakrishnan et al. (2016), which demonstrated cost savings through process optimization in a healthcare setting. Numerous case studies demonstrate the application of process optimization across different industries. For example, in the automotive industry, process optimization has been used to enhance production efficiency and reduce defects (Ko & Kim, 2017). In the energy sector, optimization techniques have been employed to maximize energy generation and minimize operational costs (Nair et al., 2019). Additionally, studies in the food industry have focused on optimizing processing parameters to improve product quality and shelf life (Pardeshi & Patwardhan, 2015). Process optimization is a vital aspect of operational excellence, enabling organizations to achieve higher efficiency, cost savings, and improved quality. By utilizing methodologies such as Lean Six Sigma and mathematical modeling, businesses can identify and implement process improvements.

2.4 Pricing Issue

In the rice industry, pricing issues have a significant impact on the profitability and competitiveness of rice companies. By improving the quality of paddy through process optimization, rice companies can enhance market position and navigate the pricing complexities in the industry. Several factors influence rice prices, including supply and demand dynamics, market competition, government policies, and global trade. Li et al. (2019) conducted a comprehensive study on rice price determination and found that factors such as weather conditions, production costs, and trade policies significantly affect rice prices. Market competition adds complexity to pricing decisions for rice companies. Jang et al. (2018) examined the relationship between market competition and pricing strategies in the Korean rice industry, and found that companies employing value-based pricing strategies, focusing on product differentiation and customer preferences, achieved higher prices and improved profitability compared to competitors. Ensuring fair compensation for farmers is crucial in pricing within the rice industry. Silva et al. (2020) emphasized the importance of implementing fair pricing mechanisms that take into account production costs, market conditions, and the socio-economic well-being of farmers. The authors underscored the significance of establishing transparent and equitable pricing systems to enhance farmer welfare and uphold sustainable relationships between rice companies and farmers. Process optimization plays a vital role in addressing pricing issues in the rice industry. By optimising the production process, rice companies can improve the quality of paddy, which, in turn, affects pricing. Lee et al. (2017) investigated the impact of process optimization techniques, such as improved drying methods and storage practices, on rice quality and pricing. The study revealed that process optimization not only enhanced the quality of rice but also allowed companies to command higher prices for the superior products. By understanding the factors influencing rice prices, implementing value-based pricing strategies, ensuring fair compensation for farmers, and leveraging process optimization techniques, rice companies can navigate pricing complexities while improving the quality of paddy. This integrated approach combining business and engineering elements is crucial for achieving optimal pricing and quality outcomes in the rice industry.

2.5 Procurement Practices

Procurement plays a crucial role in the success of organizations by ensuring the timely and cost-effective acquisition of goods and services. Strategic procurement emphasizes the alignment of procurement activities with organizational goals and objectives. According to Carter et al. (2015), strategic procurement involves proactive supplier relationship management, risk assessment, and long-term planning. The literature emphasizes the importance of developing a comprehensive procurement strategy that integrates supplier selection, contract management, and performance evaluation. Effective supplier relationship management (SRM) is critical for achieving desired procurement outcomes. SRM involves establishing collaborative relationships with suppliers based on trust, communication, and mutual benefits. Chen et al. (2016) argued that successful SRM leads to improved supplier performance, increased innovation, and reduced supply chain risks. Sustainable procurement focuses on integrating environmental, social, and ethical considerations into the procurement process. Research by Walker et al. (2016) highlights the potential benefits of sustainable procurement, including reduced environmental impact, enhanced corporate reputation, and improved stakeholder relationships. The literature emphasizes the need for supplier assessment on sustainability criteria, such as carbon footprint, social

responsibility, and ethical sourcing, to promote sustainability in procurement practices. The advancement of technology has revolutionized procurement practices. Digital platforms, e-procurement systems, and data analytics have streamlined procurement processes, improved transparency, and enhanced decision-making. According to Korpela et al. (2019), the integration of technology enables automation of routine tasks, real-time monitoring of supplier performance, and improved data-driven decision-making. The literature highlights the importance of embracing digitalization to enhance efficiency, reduce costs, and drive innovation in procurement. Effective risk management is crucial in procurement to mitigate potential disruptions and ensure continuity in the supply chain. The literature emphasizes the need for proactive risk identification, assessment, and mitigation strategies. Monczka et al. (2015) argued that risk management should encompass supplier risk assessment, contingency planning, and supply chain resilience. The research highlights the significance of robust risk management practices to safeguard against supplier failure, natural disasters, and other external threats.

3.0 RESEARCH METHODOLOGY

This study utilizes a qualitative research design approach to gain a comprehensive understanding of the manufacturing process, quality control procedures, and pricing mechanisms within APRM. The qualitative method allows for an in-depth exploration of these aspects. To gather valuable insights, semi-structured interviews were conducted through WhatsApp and Google Meet with key participants, the APRM founder and manager. The selection of these interviewees was based on the expertise and involvement in paddy production and pricing. The interviews were recorded and detailed notes were taken for subsequent analysis.

In addition to the primary data obtained through interviews, secondary information was also utilized. This includes data on total paddy production and productivity of the granary areas, as well as information on paddy productivity in selected countries in Southeast Asia. Furthermore, Malaysia's rice self-sufficiency level was taken into account as a relevant indicator. The recordings and notes from the interviews, WhatsApp conversation, along with the secondary information, underwent a thorough review. This analysis aimed to identify common themes and patterns related to the manufacturing process, quality control, and pricing issues. By integrating the qualitative findings from the interviews, WhatsApp chat, and the secondary information, a comprehensive understanding of the research questions was achieved. The qualitative findings were carefully integrated to provide a holistic perspective on the subject matter.

3.1 Research Flow

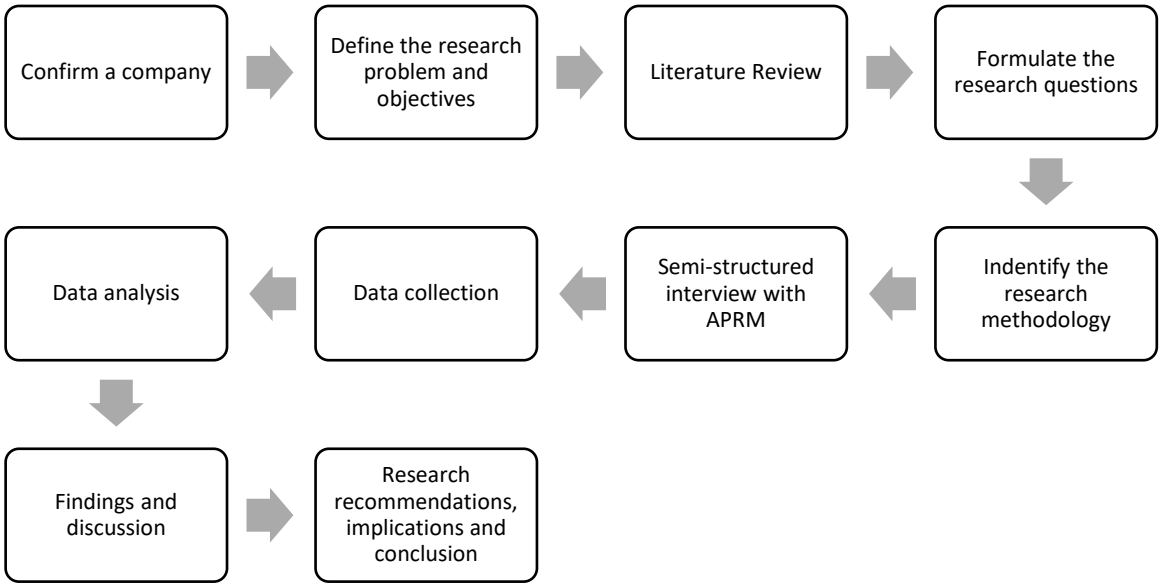

Figure 1. Research flow

4.0 RESEARCH FINDINGS

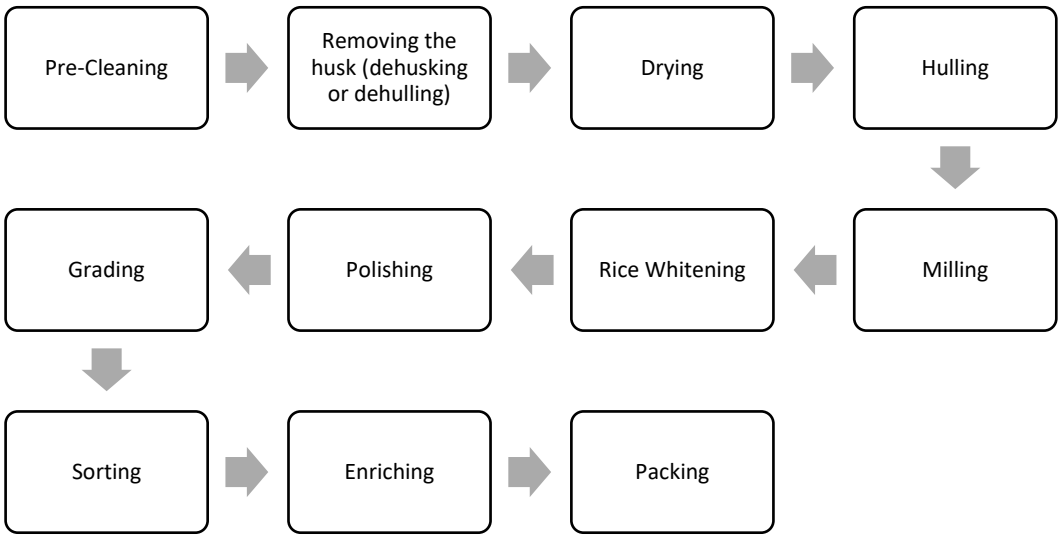

Figure 2. Steps and stages in the manufacturing process of paddy in APRM

In the initial step of rice processing, cleaning is paramount to remove undesired foreign matter and maintain the proper functioning of the Rice Milling machinery. This involves the use of sieves and closed circuit aspiration systems to eliminate dust and light impurities through positive air suction (Lee & Lim, 2019). Additionally, a destoner/gravity separator is employed to remove heavier undesired material through the principle of specific gravity, separating stones and other impurities from the rough rice.

Before milling, the moisture content of rice grains must be decreased to a range of 18-22%. The drying stage is a critical step in rice processing as it reduces the moisture content of the grains to a suitable range of 18-22% (Sombatsompop et al., 2020). Currently, APRM employs artificially heated air with the temperature of 53 degree Celcius for drying purposes. However, it has been observed that the temperature used in the drying process has led to damage in the rice quality. To enhance the quality of paddy in APRM, it is recommended to carefully control the drying temperature. The optimal temperature for drying rice should be around 40-45 degrees Celsius. This temperature range ensures efficient moisture removal while minimizing the negative impact on the rice grains' overall quality. By adhering to the recommended temperature range, APRM can prevent excessive drying, which can lead to brittle rice grains and decreased overall quality. It is important to strike a balance between moisture removal and maintaining the integrity of the rice grains. This temperature adjustment will help prevent spoilage during storage, improve stability, and ultimately enhance the overall quality of paddy in APRM. Implementing the appropriate drying temperature will contribute to optimizing the process, improving the quality of paddy, and subsequently enhancing the profitability and customer satisfaction of APRM.

Hulling, the process of removing the outer bran layers, can be done manually by rolling or grinding the rough rice between stones. However, automated processes are more commonly used in rice mills. The rough rice is cleaned using sieves and blown air, then hulled by a machine that mimics the action of handheld stones. The hulling machine loosens the hulls by rolling the machine between metal sheets coated with abrasives, resulting in the removal of 80-90% of the kernel hulls. Subsequently, the grains and hulls are separated, and the hulled rice grains, known as brown rice, are obtained (Suksomboon et al., 2021).

Brown rice, with its outer bran layers, undergoes milling to create visually appealing white rice. The process involves two huller machines that rub the grains against each other, removing the remaining bran layers. The grains are then cooled and polished by a brush machine, resulting in smooth white rice. To ensure quality, broken kernels are sifted out using a brewer's reel, and glucose coating may be applied for increased luster (Suksomboon et al., 2021). To achieve further whiteness and remove any remaining bran particles, using emery stones, brown rice is rubbed against a rough surface. The amount of whiteness in the whitening machines is determined by the velocity, grid size, clearance, and external pressure. The bran layer that is removed during this procedure is transported pneumatically to a different room for additional processing or storage (Bisht et al., 2019).

A humidified rice polisher is used to smooth out the rice's surface after it has been whitened. With mistified air acting as a lubricant, the rice surface is rubbed against another rice surface in this process. The surface texture is smoother as a result. Similar to whitening, the polishing procedure removes the bran layer, which is then treated or kept separately (Bisht et al., 2019). Removing broken rice grains from whole rice is the main goal of the grading procedure. When broken or small grains fit through an indented cylindrical screen rotating at a specified speed, these grains are propelled upward by centrifugal force and collected in a trough. The average length of the grains can be regulated by changing the trough's spinning speed and angle (Lee & Lim, 2019).

Discoloured rice grains are successfully eliminated from the batch in order to guarantee uniformity and quality. When discoloured grains are detected using rice colour sorting machines with photo sensors or CCD sensors, voltage signals are produced. The discoloured grains are subsequently eliminated by air jets through solenoid valves. This process guarantees a visually appealing final product (Sombatsompop et al., 2020). During milling, the outer bran layers containing vitamins and minerals are largely removed. To restore these nutrients, the rice undergoes further processing known as enrichment. This can be done in two ways: by steaming the rice under pressure to transfer vitamins and minerals from the bran layers to the kernel itself or by submerging already milled rice in a vitamin and mineral bath. Once soaked, the rice is dried and mixed with unconverted rice, resulting in converted rice (Bisht et al., 2019). The final stage of the rice processing involves packing the finished product for storage and delivery to customers. Proper packaging ensures the preservation of rice quality, protecting it from external factors such as moisture and pests. Appropriate storage conditions are maintained to uphold the rice's freshness and nutritional value (Sombatsompop et al., 2020).

APRM's capacity to remain profitable hinges on the quality of paddy due to its direct impact. The company's paddy production is experiencing a reduction in quality, causing lower yields and reduced profitability. There are several potential areas for process optimization that can significantly enhance the quality of paddy in APRM. First and foremost, APRM can do improvement in the cleaning process of paddy. It can be done by implementing advanced sieving techniques that can enhance the efficiency and effectiveness of the cleaning process. This involves the use of finer mesh sieves that can effectively separate smaller impurities from the paddy grains. The finer sieves allow for a more thorough cleaning, resulting in a higher quality end product. Research by Rahman et al. (2019) supports the efficacy of advanced sieving techniques in improving the cleaning process. Hulling, the removal of the outer husk from the rice grains, is another area that can be optimized to enhance paddy quality. The use of automated hulling machines can significantly improve the efficiency and effectiveness of the hulling process. These machines mimic the action of handheld stones but with greater precision and consistency. By rolling the rice grains between metal sheets coated with abrasives, automated hulling machines can remove a substantial portion (around 80-90%) of the kernel husks (Rahman et al., 2019). This ensures a higher-quality end product with reduced hull content. The milling and whitening stages contribute to the production of refined white rice. Research by Kaewruen et al. (2020) suggests that utilizing two huller machines and employing a brush machine for polishing can result in a smooth, visually appealing white rice. Additionally, the use of rice color sorting machines can effectively remove discolored grains, ensuring uniform quality and appearance. Other than that, grading and sorting play a significant role in determining the quality and market value of rice. Research by Jain et al. (2018) emphasizes the importance of utilizing cylindrical indented screens and rice color sorting machines to remove broken grains and discolored rice. This optimization step ensures that only high-quality grains are selected, enhancing the overall quality of the paddy. By focusing on these potential areas for process optimization, APRM can significantly improve the quality of paddy.

Another critical challenge confronting APRM is the pricing issue. There have been struggles for the company in its efforts to create a pricing structure that remains viable and pleases both itself and farmers at the same time. Without a sustainable pricing model, the two parties have gotten into conflicts. Through an in-depth analysis of procurement practices in the rice industry, as well as considering the specific challenges faced by APRM, developing strong and collaborative relationships with suppliers is crucial for effective procurement. APRM should focus on establishing long-term partnerships with reliable suppliers who can provide high-quality paddy at competitive prices. This can be achieved through regular communication, mutual trust, and joint planning (Wagner & Bode, 2008). In addition, APRM needs to implement a strategic sourcing approach to optimize the procurement process. This involves identifying and evaluating potential suppliers, negotiating contracts, and selecting the most suitable sources of paddy based on quality, price, and reliability. Accurate demand forecasting is essential to avoid overstocking or shortages, which can impact pricing. APRM should invest in advanced forecasting techniques, such as statistical models and market analysis, to predict the demand for rice and adjust procurement accordingly. This helps in optimizing inventory levels and reducing costs associated with excess or insufficient supply (Chopra & Meindl, 2015). APRM also should emphasize effective contract management to ensure compliance with agreed terms and conditions. This includes monitoring supplier performance, resolving conflicts, and enforcing penalties or incentives based on predetermined metrics. Well-managed contracts contribute to a more transparent and accountable procurement process, reducing the risk of pricing issues (CIPS, 2018).

5.0 RESEARCH CONTRIBUTION

The research on improving the quality of paddy and addressing pricing issues through process optimization in APRM makes significant contributions to both theoretical and practical aspects. Theoretical contributions include expanding the understanding of how process optimization techniques can positively impact paddy quality. By qualitatively analyzing the correlation between specific optimization measures and various quality attributes of paddy, such as grain size, texture, cooking characteristics, and nutritional content, the study enhances the theoretical knowledge in this field. Additionally, this research examines the economic implications of improved paddy quality, and cost-effectiveness of process optimization techniques. These insights provide valuable theoretical perspectives on the financial feasibility and potential returns on investment for APRM.

On the practical side, this research offers practical recommendations and insights for APRM seeking to improve the quality of paddy and address pricing issues through process optimization. By identifying the key factors affecting paddy quality and potential areas for process optimization, the study provides actionable guidance for implementing changes in

manufacturing practices. It helps APRM understand the specific obstacles the company may encounter when adopting process optimization practices. By exploring these challenges and suggesting strategies to overcome these obstacles, the research facilitates the widespread adoption of process optimization, leading to improved paddy quality and pricing outcomes in APRM.

Overall, the research contributes to the body of knowledge by deepening the theoretical understanding of the relationship between process optimization and paddy quality, as well as providing practical recommendations for APRM to enhance the company operations. By bridging the gap between theory and practice, this research offers valuable insights and tools for APRM to improve competitiveness, profitability, and customer satisfaction by optimizing the manufacturing process and addressing pricing issues.

6.0 DISCUSSION

First, the results of the study shed light on the existing challenges faced by APRM in relation to rice quality and pricing issues.

Objective 1: To identify the manufacturing process of paddy in APRM.

Based on the research findings, the manufacturing process of paddy in APRM involves several key steps. Firstly, after the paddy plants reach full growth and the grains begin to ripen, the water is drained from the fields, allowing the grains to further ripen. Harvesting is then carried out, followed by the transfer of the harvested rice to the processing plant. One of the critical steps in the manufacturing process is cleaning. It ensures the removal of undesired foreign matter from the paddy. The rough rice undergoes sieving, and a closed circuit aspiration system is employed to eliminate dust and light impurities through positive air suction. Additionally, a destoner/gravity separator is used to remove heavier undesired material from the rough rice based on the principle of specific gravity. After the cleaning process, the paddy undergoes drying to reduce its moisture content to the optimal range of 18-22%. This can be achieved either through the use of artificially heated air or by naturally drying the rice grains on racks in fields. Proper drying is crucial to maintain the stability of the grains and prevent spoilage during storage (Sombatsompop et al., 2020).

Once the paddy is dried, hulling is performed to remove the outer husk or hull from the rice grain. This can be done either manually by rolling or grinding the rough rice between stones or by using automated machinery. The process involves cleaning the rice, followed by hulling using machines that mimic the action of handheld stones. The shelling machine rolls the rice grains between two metal sheets coated with abrasives, effectively removing 80-90% of the kernel hulls. The separated grains and hulls are further processed to complete the hulling process (Sombatsompop et al., 2020). The next step in the manufacturing process is milling. The brown rice, which still retains the outer bran layers, is passed through huller machines that remove the bran layers. The grains are pressed against the inner wall of the huller, where the rotating core and inner wall rub off the bran layers. The polished white rice undergoes additional processes such as cooling, polishing with a brush machine, and sorting to remove broken or discolored grains. The resulting polished white rice is then packed and stored for delivery (Sombatsompop et al., 2020).

These findings provide a comprehensive understanding of the manufacturing process of paddy in APRM. By identifying the specific steps involved, it becomes possible to analyze each stage for potential process optimization, which can ultimately lead to improved paddy quality and address pricing issues.

Objective 2: To improve the quality of paddy through process optimization in APRM.

The research findings related to the objective of improving the quality of paddy through process optimization in APRM have identified specific interventions that can be implemented to enhance the quality of the rice produced. One key area of focus is optimizing the various stages of the production process to minimize quality degradation. One important aspect highlighted by the findings is the optimization of the drying process. It is crucial to control the temperature during drying to prevent damage to the paddy. High temperatures can lead to excessive moisture loss and result in cracked or damaged grains, while low temperatures can prolong the drying process and increase the risk of mold or fungal growth. By carefully monitoring and controlling the temperature during drying, APRM can ensure that the paddy retains its quality and nutritional value.

Another area of process optimization identified in the findings is the improvement of storage conditions. Proper storage is essential to prevent moisture absorption, insect infestation, and quality deterioration of the paddy. Implementing measures such as adequate ventilation, proper sealing of storage containers, and regular monitoring of moisture levels can help maintain the quality of the paddy over an extended period. Furthermore, the research findings emphasize the importance of quality control measures throughout the production process. Regular monitoring and inspection of the paddy at various stages can help identify any potential quality issues and allow for timely corrective actions. This includes monitoring factors such as moisture content, grain size, texture, and the presence of impurities or foreign matter. By implementing effective quality control protocols, APRM can ensure that only high-quality paddy is processed and delivered to customers. By implementing these process optimization interventions, APRM can improve the overall quality of its paddy production. This, in turn, can enhance customer satisfaction, increase market competitiveness, and potentially lead to higher market value for its rice products.

In summary, the research findings provide practical insights for APRM to optimize its production processes and improve the quality of its paddy. By focusing on areas such as drying, storage, and quality control, APRM can minimize quality degradation and enhance the overall value of its rice products.

Objective 3: To suggest the best procurement practices for APRM in solving pricing issues.

To suggest the best procurement practices for APRM in solving pricing issues, several key considerations need to be taken into account. The goal is to establish a procurement strategy that ensures fair pricing, fosters positive relationships with farmers, and promotes long-term sustainability for both APRM and its suppliers. Firstly, it is important to conduct a thorough analysis of the current pricing issues faced by APRM. This involves examining the factors influencing pricing, such as market trends, supply and demand dynamics, and production costs. By understanding these factors, APRM can identify areas where pricing inefficiencies exist and develop strategies to address those areas.

One potential procurement practice to consider is the implementation of forward contracts or long-term purchasing agreements with farmers. This approach provides stability for both parties, as farmers have a guaranteed market for its produce, while APRM can secure a consistent supply of high-quality paddy at a predetermined price. By establishing long-term relationships with farmers, APRM can build trust and ensure a steady supply of paddy, mitigating pricing fluctuations caused by market volatility. In addition, implementing a strategic sourcing approach is crucial for optimizing the procurement process of APRM. Strategic sourcing involves a systematic and proactive approach to identify, evaluate, and select suppliers based on its ability to meet the company's needs in terms of quality, cost, delivery, and other relevant criteria. It aims to maximize value and minimize risks through effective supplier management and collaboration.

By implementing a strategic sourcing approach, APRM can achieve several benefits. Firstly, it enables the company to gain a deep understanding of its supply chain and identify opportunities for improvement. This involves conducting a thorough analysis of the current supplier base, evaluating its performance, and identifying areas where changes can be made to enhance efficiency and cost-effectiveness. By leveraging data and analytics, APRM can make informed decisions regarding supplier selection, negotiation, and relationship management.

One key aspect of strategic sourcing is supplier relationship management. APRM can develop strong partnerships with key suppliers, fostering collaboration, trust, and mutual benefits. This can involve regular communication, joint planning, and sharing of information to improve supply chain visibility and responsiveness. By working closely with suppliers, APRM can gain access to its expertise, innovation, and market knowledge, which can contribute to continuous improvement in the procurement process and overall operational performance.

7.0 CONCLUSION

In conclusion, this research has provided valuable insights into improving the quality of paddy and addressing pricing issues through process optimization in APRM. The findings have contributed to the understanding of the research problems and have practical implications for the paddy industry. The significance of the findings, both in theoretical and practical terms, has been highlighted, showcasing its potential impact on the company, farmers, and the overall agricultural sector. Additionally, this study has addressed gaps in the existing literature by providing specific recommendations for process optimization and fair pricing practices.

8.0 LIMITATION

One limitation of the research was the inability to physically visit APRM's location due to distance and lack of transportation. This restricted the researcher's ability to directly observe the manufacturing process and gather real-time data. Field visits allow researchers to gain valuable insights and collect data that may not be available through other means. Without this firsthand experience, the depth of understanding regarding APRM's operations and the potential impact on paddy quality and pricing issues may have been compromised. Another limitation of the research relates to the possibility of incomplete or insufficient responses during interviews conducted with APRM. Interviews are crucial for obtaining detailed information and insights from key stakeholders. However, if the interviewees fail to provide comprehensive answers or omit certain details, it may impact the overall quality and completeness of the research findings. Incomplete responses can limit the researcher's ability to fully understand the complexities of process optimization and its impact on paddy quality and pricing issues within APRM. The research focused on the specific context of APRM, which may limit the generalizability of the findings to other rice companies or industries. Each organization has its own unique characteristics, practices, and challenges. Therefore, the experiences and outcomes observed in APRM may not be fully representative of other rice companies or industries. The limited generalizability reduces the broader applicability of the research findings and highlights the need for caution when applying the results to other contexts.

9.0 RECOMMENDATION

Based on the research findings, several recommendations can be made for future research and expanded thinking about the research problem. Firstly, further investigation can focus on the implementation and evaluation of process optimization strategies in APRM and other paddy companies. APRM should actively adopt and implement process

optimization techniques to enhance the quality of paddy. Long-term monitoring and assessment of the impact of these strategies on paddy quality and pricing stability can provide valuable insights. Additionally, future studies can explore the influence of external factors, such as climate change and market dynamics, on paddy quality and pricing. This would further enhance our understanding of the complexities involved and facilitate the development of effective strategies.

Furthermore, it is recommended to conduct comparative studies across different paddy companies and regions to identify best procurement practices and pricing models. This would enable a broader perspective on addressing pricing issues and promote knowledge sharing within the industry.

In summary, this research has made significant contributions to improving the quality of paddy and addressing pricing issues in APRM. The discussion, conclusion, and recommendations provided a comprehensive understanding of the research findings, its significance, and future directions for further exploration. By implementing the suggested process optimization and procurement practices, APRM can enhance the quality of its paddy, improve pricing stability, and contribute to the overall advancement of the paddy industry.

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11.0 APPENDICES

Table 4. Semi-structured interview questions with APRM

1.	Can you briefly introduce yourself and your role in the rice company?
2.	What is your experience and expertise in the rice industry?
3.	What are the major challenges the rice company is facing in terms of paddy quality and pricing?
4.	How do these challenges impact the overall operations and profitability of the company?
5.	What specific measures or strategies have been implemented so far to improve the quality of paddy?
6.	What areas of the rice production process do you believe can be optimized to enhance paddy quality?
7.	Are there any specific steps or stages in the process that require improvement?
8.	How are the current pricing issues affecting the company's profitability and market competitiveness?
9.	What strategies or approaches have been considered to address these pricing challenges?
10.	What are your future plans for enhancing paddy quality and addressing pricing issues in the rice company?
11.	Are there any specific recommendations or strategies you would like to propose based on your experience and expertise?
12.	Is there any additional information or insights you would like to share related to improving paddy quality and pricing in the rice company?

Figure 3. Interview Session with APRM