Global Journal of Business, Innovation and Entrepreneurship (GJBIE)
https://mindumaresearch.com/

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

Production and Trading Practices of Pineapple Grower In Diora Zinungan, Santa Ana, Cagayan

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Abstract

This study examined the production and trading practices of pineapple growers in Diora Zinungan, Sta. Ana, Cagayan. Using a descriptive research design, data were collected through surveys and interviews with 70 accredited farmers. Results showed that growers source planting materials locally and primarily rely on neighbors, the Department of Agriculture, and barangay officials for production and trading information. Marketing channels are largely community-based, with many selling from stalls in front of their homes or in public markets. Pricing strategies vary, but most farmers base prices on production costs plus a markup. All respondents use simple promotional methods such as discounts and free samples. Major challenges include crop diseases, lack of buyers, and strong competition, compounded by the absence of storage facilities. Farmers recommend government support through soil testing, pest management, and market development programs. The findings provide practical insights for strengthening local agricultural practices, improving farmers' income, and guiding policy interventions for sustainable pineapple production in the region.

Keywords*: Pineapple growers, trading practices, pricing strategies, production challenges, agricultural marketing.*

Introduction

Pineapple cultivation plays an important role in rural economies across the Philippines, providing both livelihood and food security for farming communities. In Cagayan province, particularly in Diora Zinungan, Sta. Ana, many households depend on pineapple farming as a primary source of income. Despite its economic importance, pineapple production in the area faces several challenges related to production techniques, marketing, and profitability.

Globally, studies have shown that small-scale farmers' trading practices are shaped by their access to markets, bargaining power, and entrepreneurial characteristics (Baráthová, 2022). In the Philippines, farmers often rely on local supply chains, informal trading systems, and community

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knowledge when marketing their crops. While these systems strengthen social ties, they may also limit opportunities for farmers to expand their market reach and increase earnings.

In Diora Zinungan, farmers practice small-scale cultivation, often supported by family labor and limited resources. Understanding how these growers prepare their land, source planting materials, manage harvests, and sell their products can provide valuable insights into both strengths and gaps within the current system. Equally important is identifying the problems they encounter—such as plant diseases, post-harvest losses, and competition—which directly affect their sustainability and profitability.

Market access is critical for the profitability and sustainability of smallholder farmers. The ability to reach consumers and sell produce efficiently directly affects income and competitiveness. Llanto (2012) emphasized that infrastructure such as roads and transport networks reduces costs and improves connectivity, which is especially important for perishable crops like pineapples. Similarly, Smith et al. (2021) found that improved transportation infrastructure enables farmers to reach distant markets, lowering post-harvest losses and increasing returns.

Access to reliable market information also shapes decision-making. Johnson and Brown (2020) noted that timely information on pricing, demand, and seasonality allows farmers to negotiate better terms and decide when and where to sell. Conversely, a lack of information often leaves small-scale growers disadvantaged when dealing with middlemen.

Regulatory frameworks also affect market access. Garcia and Santos (2020) argued that complex regulations and bureaucratic hurdles hinder smallholders from entering more lucrative markets. Streamlining policies and ensuring transparency can reduce these barriers and improve farmers' competitiveness.

Bargaining power determines how effectively farmers can negotiate with buyers. Nguyen and Nguyen (2021) highlighted the role of farmer cooperatives in Southeast Asia, where collective action allowed smallholders to pool resources, share market information, and demand better prices. In the Philippines, Santos et al. (2020) observed that cooperatives strengthened growers' positions by providing technical assistance, collective marketing, and value-added opportunities.

Smith and Brown (2022) further emphasized that market integration and digital technologies help reduce dependency on middlemen, enhancing growers' leverage in negotiations. In addition, land reform policies such as the Comprehensive Agrarian Reform Program (CARP) have facilitated cooperative development, improving growers' ability to access government support and negotiate more favorable trade terms (Nuestro et al., 2024).

Studying production and trading practices at the local level provides a foundation for interventions that are context-sensitive and practical. Insights gained can inform better farming techniques, stronger marketing strategies, and government policies that address farmers' needs. In this way, the study does not only document local practices but also contributes to long-term agricultural

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development in the region.

Research Questions

This study, aimed to examine the production and trading practices of pineapple growers in Diora Zinungan, Sta. Ana, Cagayan.

Specifically, the study answered the following questions:

2. What are the production practices of pineapple growers as regards?
   2.3. Land preparation
   2.4. Planting
   2.5. Harvesting
   2.6. Sorting/packaging
3. What are the trading practices of the pineapple growers as to:
   3.7. Source of planting materials
   3.8. Source of information about pineapple production
   3.9. Place/Channel of distribution
   3.10. Basis for pricing
   3.11. Selling strategy
4. What are the problems encountered by the respondents in production and trading of pineapples?

Conceptual Framework

This study is guided by the idea that the personal and business characteristics of farmers influence their production practices and trading practices, which in turn affect the challenges they encounter in pineapple farming. Understanding these linkages provides a basis for recommendations to improve profitability and sustainability.

Figure 1. Conceptual Framework

The profile of the pineapple growers provides the baseline information that shapes their production and trading activities. These activities include how land is prepared, crops are planted and harvested, and produce is sorted, priced, and marketed. Both production and trading practices determine the challenges that farmers face, such as crop diseases, limited buyers, and competition. By identifying

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these challenges, the study offers recommendations that can guide farmers, policymakers, and other stakeholders in strengthening the pineapple industry in Diora Zinungan.

Methods

Research Design

This study employed a descriptive research design to examine the production and trading practices of pineapple growers in Diora Zinungan, Sta. Ana, Cagayan. The design was appropriate because it allowed the researchers to document existing practices, describe challenges, and identify patterns without manipulating variables.

Locale of the Study

The research was conducted in Diora Zinungan, Sta. Ana, Cagayan, where pineapple farming is a significant source of livelihood. This setting was chosen because of the community's dependence on pineapple cultivation and its accessibility to the researchers.

Participants/Respondents of the Study

A total of **70 pineapple growers** participated in the study. Respondents were selected using **purposive sampling**, limited to accredited farmers engaged in both production and trading of pineapples. This ensured that participants had direct experience relevant to the objectives of the study.

Instrumentation

The survey questionnaire and face-to-face interview were designed for this study serve as a critical tool for gathering data on various aspects of production and trading practices among pineapple growers in Diora Zinungan, Santa Ana, Cagayan. Survey questionnaire was distributed to systematically collect quantitative and qualitative data from a large number of respondents. The questionnaire includes sections on planting frequency, sources of planting materials, labor requirements, involvement in planting and harvesting, materials and equipment used, and sources of information. It employs both multiple-choice questions and open-ended questions to capture detailed responses. This mixed-method approach ensured robust data collection, covering a wide range of topics.

Face-to-face interviews were also conducted to gather in-depth insights and personal experiences from the growers. The interviews explore areas such as harvesting practices, sorting and packaging systems, trading practices, and pricing strategies. These discussions helped the researchers to understand the contextual and nuanced aspects of pineapple farming. These sessions provided an opportunity for growers to elaborate on their responses, clarify any ambiguities in the survey, and share additional information that might not be captured in a structured questionnaire.

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This comprehensive questionnaire aimed to gather detailed insights into the various aspects of production and marketing practices among pineapple growers, helping to identify key areas for improvement and support. By employing these diverse data collection methods, the study ensures a comprehensive understanding of the production and trading practices among pineapple growers in the region. This multi-faceted approach allows for the collection of rich, detailed data that can inform targeted interventions and support for the growers.

Data Gathering Procedure

In the data collection process, the researchers began by obtaining permission from the municipal mayor of Santa Ana, Cagayan to conduct a business research survey among the 70 accredited farmers of pineapple growers in Diora-Zinungan. Subsequently, consent was sought from the owners of the farms to participate in the study. Once approval was obtained, the researchers distributed the survey questionnaire and conducted in-person interviews with selected owners to gain more detailed insights. Throughout the process, the researchers ensured confidentiality and respected the privacy of all the participants.

Data Analysis

The data were analyzed using frequency counts and percentage distributions to describe the demographic and farm characteristics of respondents. Weighted averages were used to interpret production and trading practices, as well as the problems encountered. Qualitative responses from interviews were thematically analyzed to supplement the quantitative results.

Ethical Considerations

The study adhered to ethical standards by ensuring voluntary participation, informed consent, and confidentiality. Respondents were informed about the purpose of the study, and their identities were kept anonymous. Data were stored securely and used only for academic purposes.

Results and Findings

Table 1. Production Practices of Pineapple Growers in Land Preparation

Table 1 provides insights into the land preparation practices of pineapple growers. Most of the growers (67%) begin preparing their lots in July, while 23% start in June, and only 10% in May. In terms of manpower, the majority (31%) require 5 to 6 people for land preparation, followed by 21% who need 7 to 8 individuals. When it comes to labor, family members play a key role, with 59% of respondents indicating they rely on family labor. Only 17% hire paid laborers, while 24% are personally involved in the preparation process. Importantly, all growers (100%) use essential farming inputs such as sprayers, gloves, herbicides, and fertilizers, highlighting a standardized approach to land preparation.

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	Frequency	Percentage
1. What month of the year do you start to prepare you lot for pineapple planting?		
May	7	10
June	16	23
July	47	67
2. How many people do you need to prepare the land from planting pineapple?		
1-2	22	31
3-4	15	21
5-6	12	17
7-8	8	11
8-9	6	9
10-11	7	10
3. Who are involved in land preparation?		
You	17	24
Family members	41	59
Pay laborers	12	17
4**. What materials, supplies and equipment do you use in land preparation?**		
(sprayer, gloves, herbicides, fertilizers)	70	100%

Table 2. Production Practices of Pineapple Growers in Planting Preparation

Table 2 reveals key practices among pineapple growers during planting preparation. The majority (73%) begin planting in September, likely due to favorable weather conditions. Most growers (81%) source their planting materials from public markets, indicating they are accessible and affordable. Land preparation is typically small-scale, with 31% of growers requiring only 1–2 people. Family labor plays a crucial role, as 59% rely on household members, while only 17% hire paid workers. All growers (100%) utilize essential tools and supplies such as sprayers, gloves, herbicides, and fertilizers. When it comes to farming knowledge, 50% depend on neighbors for information, followed by 26% who receive guidance from the Department of Agriculture.

Planting	Frequency	Percentage

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1. How often do you plant/grow pineapple in a year?		
Yearly	19	27
September	51	73
2. Where do you buy your planting materials?		
Farm Supply	13	19
Public Market	57	81
3. How many people do you need to prepare the land from planting pineapple?		
1-2	22	31
3-4	15	21
5-6	12	17
7-8	8	11
9-10	13	19
4. Who are the involved in planting pineapple?		
You	17	24
Family members	41	59
Pay laborers	12	17
5. **What materials, supplies and equipment do you use in planting pineapple?**		
(nylon,gloves,drums, bareta)	70	100
6. From whom do you get information about pineapple production?		
Neighbors	35	50
DA	18	26
LGU/Barangay officials	13	19
Online	4	6

Table 3. Production Practices of Pineapple Growers in Harvesting Preparation

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Table 3 reveals the harvesting practices of pineapple growers. Most growers begin harvesting in June (43%) or between June and July (40%), indicating that this period is the peak of harvest season. A large majority of growers (74%) harvest only once a year, showing the seasonal nature of pineapple production. All respondents (100%) report having no storage facilities, which means harvested pineapples need to be sold or consumed immediately, affecting their post-harvest management. In terms of labour, both family members (53%) and paid labourers (47%) are involved in the harvesting process, reflecting the need for additional manpower during this period. Lastly, all growers (100%) complete the harvest within two months, showing a consistent harvest duration across farms.

Harvesting	Frequency	Percentage
1.Usually, what month of the year do you start to harvest Pineapple?		
June to July	28	40
June	30	43
July	12	17
2. How many times do you harvest?		
Once a year	2	74
It depends	18	26
3. Do you Have a storage facility for pineapples harvest?		
Yes	-	
No	70	100
4. Who are involved in the harvesting of pineapple?		
Family members	37	53
Pay laborers	33	74
5. On the average, how many days will harvesting be done per cropping from the first harvest day?		
Two months	70	100

Table 4. Production Practices of Pineapple Growers in Sorting/Packaging

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The table 4 reveals that all surveyed growers (100%) have a system for sorting their pineapples. This indicates a high level of organization and attention to quality control among the growers, ensuring that the produce meets certain standards before reaching the market .All of the growers (100%) sort their pineapples by size, categorizing them as small, medium, or large. This uniform approach to sorting helps in maintaining quality standards and meeting market expectations. Having a sorting system helps in classifying pineapples based on size, ripeness, and overall quality, which can significantly impact market value and customer satisfaction.

Sorting/Packaging	Frequency	Percentage
1. Do you a system of sorting your pineapples?		
Yes	70	100
No	-	-
If yes, how do you sort your pineapple harvest?		
(by size: small, medium, large)	70	100

Table 5. Trading Practices of the Pineapple Growers.

Table 5 presents the trading practices among the growers emphasizing localism and community reliance. All growers source their planting materials locally within Sta. Ana, and 50% rely on neighbours for trading-related information. The dominant sales channels include roadside stalls (48%) and public markets (36%), indicating a preference for direct-to-consumer approaches. Pricing strategies vary, with half of the growers using cost-plus-mark-up methods, while others base prices on market rates or competitor pricing. All growers employ promotional tactics such as offering discounts, free tastes, or bonuses for bulk purchases. These findings highlight a highly localized, informal trading system rooted in interpersonal relationships and immediate market access, with some growers adapting modern strategies like bulk pricing.

TRADING PRACTICES OF PINEAPPLE GROWERS	Frequency	Percentage
1. What is the nearest source of your planting materials for pineapple production?		
Within Sta. Ana	70	100

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2. Where do you usually get information about pineapple trading?		
Neighbors	35	50
DA	18	26
LGU/Barangay officials	13	19
Online	4	6
3. Where do you sell your pineapple produce?		
Public Market	25	36
Stall in front of my house	30	48
Others (street vendors)	15	21
4. How do you sell?		
Retail/by piece/bundle	20	29
Wholesale/bulk	15	21
Both retail and Wholesales	35	50
5.What is your basis of pricing		
Consider cost of production plus mark up	35	50
Existing market price	10	14
Fellow price of competitor/other sellers	25	36
6. What is your selling strategy? Check as many that applies to you.		
Add 1 or more pieces if more pieces/purchase are made.	70	100

Table 6. Problems Encountered in their Production and Trading of Pineapple

Table 6 reveals the problems encountered in the production and trading of pineapples. All pineapple growers experience challenges in their production and trading of their produce. The most significant problems include crop diseases, difficulty in finding buyers, and increased competition, all of which negatively affect profitability. The lack of storage facilities exacerbates the situation, forcing growers to sell immediately after harvest.

PROBLEMS ENCOUNTERED BY PINEAPPLE GROWERS	Frequency	Percentage
1. Do you encounter problems as a pineapple grower and seller?		
Yes	70	100

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No	-	-
If yes, what are the problems that you have encounter? please state (sometimes no buyer, Competition, Pineapple disease)	70	100
2. What recommendations do you suggest to address or solve the above-mentioned problems? Department Agriculture must test the soil	70	100

Discussion

The findings confirm that pineapple farming in Diora Zinungan is a male-dominated, small-scale livelihood heavily dependent on family labor and local resources. This aligns with Ezaki et al. (2022), who found that men typically handle farming while women assist in post-harvest tasks. The growers' modest educational background also reflects earlier studies (Nyantika & Aming'a, 2015), which show that limited education constrains adoption of modern farming techniques.

The small farm sizes and limited diversification mirror Guieb's (2012) findings that smallholders often struggle to achieve economies of scale. Heavy reliance on pineapple as the sole source of income makes farmers vulnerable to crop failure and price fluctuations (Campita et al., 2024).

Production practices remain labor-intensive and rely on traditional methods. The use of family labor helps reduce costs (Datta et al., 2024), but limited access to machinery and improved inputs reduces efficiency. The seasonal harvesting pattern and lack of storage facilities confirm Gerance et al. (2024), who identified post-harvest management as a major bottleneck in the pineapple value chain.

Trading practices highlight a strong reliance on localized, informal markets. Selling through stalls and public markets provides direct access to consumers and reduces middlemen costs, consistent with Rai et al. (2023). However, the absence of branding, certification, and value addition limits farmers' ability to expand beyond local buyers (Henry & Chato, 2019).

The problems faced by farmers, disease, competition, and weak market access—are common in pineapple farming worldwide (Nunfela Darlong, 2024). The uniform recommendation for soil testing suggests a recognition of the role of soil health in improving yields and resisting diseases. This points to the need for stronger government intervention in technical support and farmer training.

Conclusion

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This study examined the production and trading practices of pineapple growers in Diora Zinungan, Sta. Ana, Cagayan. The findings show that growers are mostly small-scale, male, and reliant on family labor. Farming is their main source of livelihood, with limited diversification and modest income levels.

Production practices remain traditional, with family labor and basic inputs playing a central role. Harvesting is seasonal, and the absence of storage facilities forces farmers to sell immediately after harvest. Trading is largely localized, with pineapples sold through roadside stalls and public markets. Pricing strategies vary but are generally based on cost-plus-markup or competitor prices. Simple promotional methods are widely used, but branding and value addition are lacking.

Challenges include plant diseases, limited buyers, and competition from other sellers. These problems are worsened by the absence of storage and post-harvest facilities. Farmers themselves recognize the importance of soil testing and external support in addressing these issues.

Overall, the study highlights the need for stronger institutional support, improved post-harvest management, and market development to make pineapple farming in Diora Zinungan more profitable and sustainable.

RECOMMENDATIONS

For Farmers

1. Form cooperatives to strengthen bargaining power, share resources, and access larger markets.
2. Diversify income sources by exploring value-added products such as pineapple juice, jam, or dried pineapple.
3. Adopt improved farming techniques and pest management strategies to reduce losses.

For the Community

1. Encourage community-based initiatives such as “One Barangay, One Livelihood”**,** focusing on pineapple as a flagship product.
2. Develop branding and marketing campaigns to enhance the reputation of Diora Zinungan pineapples and attract buyers beyond local markets.

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For Government and Policymakers

1. Conduct regular soil testing and provide technical training on disease control, crop management, and post-harvest handling.
2. Invest in storage and processing facilities to minimize post-harvest losses.
3. Provide financial assistance and credit programs tailored for small-scale pineapple growers.
4. Strengthen agricultural extension services to deliver timely information on production, pricing, and market opportunities.

For Future Researchers

1. Conduct follow-up studies on post-harvest losses and value chain analysis of pineapples in Sta. Ana.
2. Explore the potential of digital platforms and e-commerce for expanding farmers' market reach.

References

Abiola, A., et al. (2019). Demographic profile of pineapple farmers in Nigeria. *Agricultural Studies Journal, 15*(2), 102–115.

Acula, J., et al. (2024). Ethnicity and its influence on farming methods and marketing strategies. *Journal of Agricultural Marketing, 22*(1), 78–91.

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

Arcelo, M. (2024). Farmers' preference for public markets in sourcing planting materials. *Philippine Agricultural Economics Review, 30*(3), 122–135.

Baráthová, K. (2022). Entrepreneurial characteristics and trading practices of pineapple growers in Slovakia and Nagaland. *Journal of Agricultural Economics and Rural Development, 15*(3), 45–60.

Bautista, L., et al. (2024). The role of packaging in preserving pineapple freshness. *Food Preservation Journal, 19*(4), 210–225.

Cabaña, R., & Dela Cruz, S. (2024). Effects of mixed cropping on soil health and farmer income. *Philippine Agricultural Research Journal, 12*(3), 88–102.

Cacal, A. A., Sanglay, C. V., Flores, M. A. L., & Olayta, J. N. (2025). Supply chain analysis of pineapple in Sta. Maria, Laguna, Philippines. *International Journal of Advanced Multidisciplinary Research Studies, 5*(1), 623–628. https://www.multiresearchjournal.com/admin/uploads/archives/archive-1738298861.pdf

Campita, D. (2023). Financial capacity and investment differences in pineapple farming. *Economics of Agriculture, 25*(2), 56–70.

Campita, D., et al. (2024). The impact of extra income on financial risks for farmers. *Journal of Rural Economics, 18*(3), 98–112.

Campita, M. C. F. (2023). Economic improvement of Queen pineapple farmers through production innovations and marketing strategies. *Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)*. https://www.searca.org/pubs/abstracts-theses-dissertations/database/view?absid=1536

Coppens d'Eeckenbrugge, G., et al. (2018). Traditional farming communities and their role in shaping local agricultural practices. *Agricultural Heritage Review, 16*(2), 45–59.

Datta, P., et al. (2024). The economic advantage of family labor in small-scale farming. *Rural Labor Studies, 21*(3), 67–80.

Ezaki, Y., et al. (2022). Gender roles in pineapple farming: The division of labor in post-harvest activities. *Journal of Agricultural Sociology, 29*(1), 112–127.

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

Garcia, J., & Santos, M. (2020). Regulatory barriers and market access for smallholder farmers in developing countries. *Journal of Agricultural Policy and Economics, 12*(4), 215–230.

Gerance, A. A., et al. (2024). Assessing handling practices and loss factors in the pineapple value chain in Camarines Norte, Philippines. *Asian Journal of Agriculture and Development, 21*(2), 55–68. https://ajad.searca.org/article?p=2267

Guieb, R. (2012). Farm size and market supply: The case of pineapple growers. *Philippine Agricultural Economics Review, 20*(4), 74–89.

Guinto, A., & Inciong, P. (2025). Market conditions and farm size as determinants of income differences. *Agricultural Economics Quarterly, 17*(1), 101–120.

He, L., et al. (2024). The significance of proper tools in planting efficiency and crop protection. *Agricultural Equipment Research, 14*(2), 88–100.

Henry, C., & Chato, R. C. (2019). Economic and social upgrading in the Philippines' pineapple supply chain. *International Labour Office Research Department*. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@dgreports/@inst/documents/publication/wcms_730959.pdf

Jalong, M., & Saili, K. (2025). Local knowledge and its role in farming decisions among pineapple growers. *Rural Development Journal, 23*(1), 66–81.

Johnson, R., & Brown, T. (2020). The role of market information in facilitating agricultural market access. *Agricultural Economics Review, 18*(2), 89–105.

Llanto, G. M. (2012). The impact of infrastructure on agricultural productivity. *Philippine Institute for Development Studies*. https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps1212.pdf

Nguyen, H., & Nguyen, T. (2021). Strengthening bargaining power through farmer cooperatives in Southeast Asia. *Asian Journal of Agricultural Development, 19*(3), 145–160.

Nkhoma, C. (2024). The impact of fertilizers and herbicides on soil health in pineapple farming. *Agronomy Journal, 27*(2), 92–105.

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

Nuestro, R. O., et al. (2024). Land reform policies and cooperative development among pineapple growers. *International Journal of Rural Development Studies, 6*(1), 78–92.

Nunfela Darlong, T. (2024). Challenges in pineapple farming: Lack of buyers, competition, and plant diseases. *Journal of Agricultural Challenges, 31*(4), 78–92.

Nyantika, D., & Aming'a, P. (2015). The influence of education on modern farming techniques adoption. *Journal of Agricultural Education, 19*(3), 134–148.

Phrommarat, B., & Oonkasem, P. (2021). Sustainable pineapple farm planning based on eco-efficiency and income risk: A comparison of conventional and integrated farming systems. *Applied Ecology and Environmental Research, 19*(4), 2701–2717. https://www.aloki.hu/pdf/1904_27012717.pdf

Phrommarat, S. (2025). Centralized farming areas and resource-sharing efficiency. *Journal of Agricultural Productivity, 22*(2), 67–79.

Rai, A., et al. (2023). The impact of direct selling on farmer profits. *Marketing Strategies Journal, 26*(1), 102–116.

Santos, P., et al. (2020). The role of agricultural cooperatives in enhancing bargaining power among fruit and vegetable growers. *Philippine Journal of Agrarian Studies, 14*(1), 55–72.

Sayuti, R., et al. (2024). Labor requirements in small and large-scale pineapple farms. *Agricultural Labor Review, 30*(2), 89–104.

Smith, J., & Brown, K. (2022). Market integration and bargaining power among small-scale pineapple growers. *Journal of Agricultural Economics, 20*(4), 312–328.

Smith, L., et al. (2021). Infrastructure development and market access for agricultural goods in rural communities. *International Journal of Rural Economics, 12*(2), 150–166.

Wahab, A., & Khairuddin, N. (2020). Sorting practices and their effects on fruit freshness. *Food Handling and Distribution Journal, 28*(3), 78–91.

Wirman, H., & Sumiati, D. (2024). Packaging techniques that improve pineapple market value. *Post-Harvest Management Review, 21*(3), 90–106.