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A Case Study on Factors Affecting Pineapple Market Supply among Smallholders in Muar, Johor

Nur Izzati Yasmin Mohd Zilkhan, Nur Wajihah Mohd Nawi, Fatin Khairuddin, Nur Nabila Huda Aziz, Nurulain Isa

Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA (UiTM), Jasin Campus Melaka branch, 77300, Merlimau, Melaka, Malaysia

Corresponding Author Email: nurwajihah@uitm.edu.my

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Abstract

Pineapple (Ananas comosus) is an important tropical fruit widely grown in Malaysia, especially within the state of Johor. While it is so important, the reality in recent times has been different with challenges on the pineapple market supply facing smallholders. Such issues include volatility prices of pineapples, changes in demand for different pineapple varieties, and challenges with market access and support extension services needed by farmers. This study was conducted in Ayer Hitam, Muar, Johor, Malaysia. The main aim of this research was to identify the factors that impact the market supply of pineapples by smallholder farmers in Muar, Johor, and to investigate the relationship between these factors mentioned with pineapple production. This study utilizes a quantitative approach. Information was collected through closed-ended questionnaires in face-to-face interviews, guaranteeing thorough and precise answers. This study included a random selection of 52 smallholder samples. The results showed that the pineapple market supply among smallholders is significantly influenced by factors such as price, variety, distance to market, extension services, and access to credit. Furthermore, the results of the regression analysis indicated that pineapple prices had an impact on pineapple productivity data. The research suggests that in order to improve the industry's performance in the international market and enhance the conditions of smallholder pineapple farmers, effective intervention strategies must be developed that target the aforementioned factors.

Keywords: Pineapple Production, Muar, Smallholders, Market Supply, Factors of Production

Introduction

The pineapple (*Ananas comosus*) from the Bromeliaceous family is a major tropical fruit that is widely grown in Malaysia, especially in the region of Johor. Originating from South America, this tropical plant was first introduced to Europe and Asia by the Spanish and Portuguese in

the 16th and 17th centuries. In the present day, pineapples are an important agricultural product that plays a role in the economies of numerous tropical and subtropical areas. It is included in the category of major fruit since it can significantly increase national and farmer incomes. The pineapple industry plays an important role in meeting the country's growing pineapple demand of 3.8% with the growth rate of pineapple production over the last 10 years. In Johor, smallholders achieved a pineapple cultivation productivity of approximately 39.6 metric tons per hectare in 2016, whereas the plantation sector recorded about 45.9 metric tons per hectare. The area of pineapple cultivation in Johor is 68% of the country's area. The area under pineapple cultivation in Ayer Hitam, Muar, has seen fluctuations over the years. Despite these fluctuations in Ayer Hitam, Muar, remains a crucial area for pineapple production, contributing significantly to Malaysia's agricultural output. In the period from 2010 until 2018, Malaysian pineapple production showed a trend of fluctuation in cycles between 350 thousand metric tons to 450 thousand metric tons. The highest production was recorded in the year 2015 which is 452,012 metric tons. The market supply of pineapples is impacted by several challenges faced by smallholder farmers in this industry. These challenges market supply, including pricing, pineapple varieties, distance to the market, extension services, and credit access. The objectives of this case study are to estimate the factors affecting pineapple market supply in Muar, Johor while also determining their relationship with the level of production conducted by smallholders. By addressing these factors, the pineapple market supply among smallholders in Muar can be significantly improved. These efforts will not only improve the livelihoods of smallholder farmers but also strengthen the overall performance of the sustainable pineapple industry in Malaysia. The results suggested from this research can significantly giving some insights to the government institutions that involves with pineapple production to come out with a significant revision for the improvement of the policies and framework so that this pineapple industry would become a sustainable industry in Malaysia.

Objective

The objective of the study is:

i) To determine the factors that affect pineapple market supply among smallholders in Muar,

Johor, Malaysia.

ii) To investigate the relationship between factors with pineapple production among smallholders in Muar, Johor, Malaysia.

Research Methodology

The study employs a quantitative research approach, utilizing closed-ended questionnaires administered through face-to-face surveys to ensure accurate and comprehensive data collection. The main data for this research were gathered from the list of pineapple farmers registered with the Malaysian Pineapple Industry Board (MPIB), revealing 128 smallholders in Muar, Johor, and 81 in Ayer Hitam, Johor, Therefore, a sample size of 52 was selected by using convenience sampling method. Data collected was analyzed through descriptive statistics, correlation analysis, and multiple linear regression using the Statistical Package for the Social Sciences (SPSS) software to assess the influence of factors on market supply and productivity. The study aimed to explore how factors like prices, variety, distance to the market, extension services, and credit access influence pineapple production using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Results and Discussions

Table 1

Socio-demographic profile of the pineapple smallholders

	Profile	Frequency (n)	Percentages
Gender	Male	52	100.0
Age	18 – 24 years old	3	5.8
	25 – 34 years old	18	34.6
	35 – 44 years old	15	28.8
	45 – 54 years old	9	17.3
	55 years and above	7	13.5
Race	Malay	52	100.0
Education level	Primary school	6	11.5
	Secondary school	20	38.5
	Certificate	7	13.5
	Diploma	10	19.2
	Degree	9	17.3
Experience as smallholder	4 – 6 years	20	38.5
	7 – 10 years	10	19.2
	Less than 3 years	8	15.4
	More than 10 years	14	26.9
Job	Family's worker	22	42.3
	Farm owner	25	48.1
	Hired labour	5	9.6
Pineapple Field Area	1.62 hectares – 4.05 hectares (4 – 8 acres)	22	42.3
	Less than 1.62 hectares (< 4 acres)	25	48.1
	More than 4.05 hectares (8 acres)	5	9.6
Variety of Pineapple Planted	MD2	25	48.1
	Josepine	35	67.3
	Morris	42	80.8

Table 1 provides an overview of the sociodemographic characteristics of the farmers. The findings indicated that the biggest group of farmers were aged between 25-34 years, making up 34.6% of the respondents. The second largest group consisted of those aged 35-44 years at 28.8%, while the smallest group was aged 18-24 years at 5.8%. This demonstrates that the majority of pineapple farmers in the study area are male. All of the participants (100%) are male. Simultaneously, all of the farmers surveyed are Malay. The majority of participants held a secondary school qualification (38.5%), with diploma holders making up 19.2%, and only a small portion (11.5%) had completed primary school. When it comes to experience, most of the participants (38.5%) had been farming for 7-10 years, (26.9%) had over 10 years of experience, (19.2%) had less than 3 years, and (17.3%) had 4-6 years of farming experience. Approximately (48.1%) of pineapple farmers have farmland less than 1.62 hectares, while (42.3%) cultivate 1.62-4.05 hectares and (9.6%) cultivate over 4.05 hectares. This shows that most of the pineapple farmers in the research area are engaged in small to medium-scale operations. Almost half of the participants are farmers (48.1%), with family workers making up 42.3% and hired laborers comprising 9.6%. In conclusion, the respondent farmers mostly

planted Morris variety pineapples (80.8%), Josepine variety pineapples (67.3%), and MD2 variety pineapples (48.1%).

Table 2
Reliability Test

Construct	Cronbach's Alpha	N
Price	0.914	20
Variety	0.844	
Distance to The Market	0.875	
Extension Services	0.744	
Access to Credit	0.789	

The results of a reliability test in Table 2 were shown to confirm the internal validity of the items for each factor obtained from factor analysis. As George and Mallery (2003) stated, a value of 0.8 indicates strong consistency in the instrument measurement, showing that the variables are dependable. A Cronbach alpha value above 0.7 indicates the factor's reliability and consistency (Hair et al., 2009). As shown in Table 2 below, each of the five (5) factors had Cronbach's alpha values above 0.7, meeting the acceptable threshold (George and Mallery, 2003). From the results of this reliability test, the questionnaires were valid to be used for the data collection in this research study.

Table 3
Result of Correlation Analysis
Correlations

		Prices	Variety	istance to the market	Extension Services	Access to Credit
Pineapple Production	Spearman Correlation	-.371**	.044	-.107	-.230	.321*
	Sig (2-tailed)	.002	.755	.450	.101	0.24
	N	52	52	52	52	52

Table 4
Multiple Linear Regression

Model Summary				
Model	R	R Square	Adjusted R Square	Error of the Estimate
1	.724[a]	.524	.470	10.765
stant), Mean_AccessCredit, Mean_Variety, Mean_Prices, Mean_ExtensionServices, Mean_Distance				

According to Anesthesia & Analgesia, (2018), Pearson correlation is a statistical measure used to evaluate the strength and direction of the relationship between two variables. The significance of the correlation is determined by a p-value, which must be less than 0.05 for the correlation to be considered statistically significant. Based on the correlation analysis in Table 3, several findings are made regarding the relationship between the factors affecting pineapple market supply and pineapple production. The correlation between prices and pineapple production is negative and significant (r = - 0.371, p = 0.002) indicating that this

relationship is statistically significant, meaning that as prices increase, pineapple production tends to decrease. The variety of pineapples and pineapple production is positive but very weak and not significant (r = 0.044, p = 0.755). So, the variety of pineapples grown by smallholders has no impact on pineapples in this study.

Moreover, distance to the market is negatively correlated with pineapple production but not significant (r = -0.107, p = 0.450). The weak negative correlation means the increased distance to the market might slightly reduce pineapple production but is not strong or significant. Extension services are negatively correlated with pineapple production but are not significant (r = -0.230, p = 0.101). Although the correlation is not strong enough to conclude anything, it means access to extension services alone might not be the key to increasing pineapple production. Finally, access to credit is positively and significantly correlated with pineapple production (r = 0.321, p = 0.024). The significant positive correlation showed that better access to financial resources means farmers can invest more in their production and therefore productivity can be improved.

The R2 value in Table 4 of the regression results showed that 52.4% of the variation in pineapples production per acre was explained by the independent variables in the model, while 47.6% was attributed to uncontrollable factors.

Conclusions

The production of pineapples has been identified as an important factor for smallholder farmers' income generation, leading to increased profits and better livelihoods for farmers, as well as overall economic development. The outcome of the factor analysis in this research indicated that pineapple prices, types of pineapples, distance to the market, extension services, and access to credit were recognized as influencing factors on pineapple supply. The results of correlation and regression analyses highlight the main factors that impact pineapple production. Specifically, production is significantly affected by the prices and accessibility of credit, while factors like variety, distance to the market, and extension services have a minor effect. It can be inferred that all factors identified in this study are crucial and should be prioritized for Malaysia to enhance and maintain its competitive edge in the global pineapple market and enhance the well-being of farmers. Strategic interventions focusing on price stabilization, variety selection, market access, extension services, and access to credit are necessary to boost the pineapple industry in the global market and improve the lives of smallholder farmers. These actions are crucial to reducing the difficulties encountered by smallholder farmers, ultimately resulting in higher market availability and better economic results for farmers.

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