

**A Study of Oil Palm Fresh Fruit Bunches (FFB) Quality Issues:
Case of Independent Smallholders in Muar, Johor.**

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APPROVAL AND DECLARATION SHEET

I hereby declare that I have read this thesis, and, in my opinion, this thesis is sufficient in terms of scope and quality for the award of a Bachelor of Technology Management with Honours (Technology Innovation)

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**A Study of Oil Palm Fresh Fruit Bunches (FFB) Quality Issues:
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**This Report Submitted in Partial Fulfillment of the Requirement for the Award of
Bachelor of Technology Management (Innovation) With Honour**

**Faculty Technology Management and Technopreneurship
University Teknikal Malaysia Melaka (UTeM)**

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DECLARATION

“I admit that this report is the result of my own work except summarizes and quotes
that everything I have explained the sources”

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Name : NORAINA FAZIRAH BINTI ASOHA

Date :

DEDICATION

I dedicate this research to my family, especially my parent, siblings and smallholders. For my supportive father, Mr.Asoha Bin Sakidin, thank you for always gives me the spirit and motivation to complete any tasks. For my loving mother, Madam Rosmawati Binti Saip, thank you for always caring about my condition and gives best support. Deepest thanks and appreciation to my supervisor Assoc. Prof. Dr. Norizah Bt Mohamad for the best guidance, support and help for this research. Deepest thank also to other lecturers for their guidance and my friends for support and help.

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ABSTRACT

Agriculture is one sector that gives a high income to the country. Palm oil industry contributed to 43.1% from the RM 89.5 billion in the agriculture sector for Malaysia Gross Domestic Product (GDP). As of 2017, it is reported that there are currently a total of 650,000 independents smallholders in Malaysia. It is the main source of income for most of these smallholders. Although the numbers of independent smallholders are small, their existence is important as they played a significant role in the development of oil palm. If independent smallholders slacken in their operations and no improvement effort is made, it will affect the overall supply chain because of their comparative cumulative size. The supply of Fresh Fruit Bunch (FFB) from the smallholders have an effect on the quality FFB of the oil extraction rate (OER). The objectives this study is to determine the critical success factors (CSF) that has effect on the quality of FFB from the smallholders. The study also identify the plans that is used to improve FFB quality and to recommend the procedures that can help independent smallholders to produce quality FFB. The study is conducted through a set of questionnaires distributed to smallholders in Muar, Johor. Response from 265 respondents were analysed using SPSS. The findings of the study shows that the quality of FFB is affected by soil, handling process and fertilizer, harvest activity and quality of seedlings. Interviews are also conducted. From the interviews, among others, it is found that some smallholders acquired the seedling from unregistered nursery and the smallholders were not able to harvest according to the schedule. This has affected the quality of the FFB. It is recommended that agencies such as Malaysia Palm Oil Board (MPOB) need to educate the smallholders on the importance of good seedlings and suggest appropriate new harvesting technologies that can help smallholders to expedite the harvesting operations.

Keywords: Fresh Fruit Bunches (FFB), Soil, Seedling, Fertilizer, Harvest, Handling Process, Oil Extraction Rate (OER).

ABSTRAK

*Pertanian adalah satu sektor yang memberi pendapatan tinggi ke negara. Industri minyak sawit menyumbangkan kepada 43.1% daripada RM 89.5 bilion dalam sektor pertanian bagi Keluaran Dalam Negara Kasar Malaysia (KDNK). Sehingga 2017, dilaporkan bahawa kini terdapat sejumlah 650,000 pekebun kecil bebas di Malaysia. Ia merupakan sumber pendapatan utama bagi kebanyakan pekebun kecil ini. Walaupun bilangan pekebun kecil yang bebas adalah kecil, kewujudannya penting kerana memainkan peranan penting dalam pembangunan kelapa sawit. Sekiranya pekebun kecil yang berdikari melonggarkan operasi mereka dan tidak ada usaha peningkatan, ia akan menjejaskan rantai bekalan keseluruhan kerana saiz kumulatif perbandingan mereka. Pembekalan Buah Tandan Segar (BTS) daripada pekebun kecil mempunyai kesan terhadap kualiti PBBS kadar pengekstrakan minyak (KPG). Objektif kajian ini adalah untuk menentukan faktor kejayaan kritikal yang memberi kesan kepada kualiti BTS daripada pekebun kecil. Kajian ini juga mengenal pasti pelan yang digunakan untuk meningkatkan kualiti BTS dan mencadangkan prosedur yang dapat membantu pekebun kecil bebas untuk menghasilkan BTS yang berkualiti. Kajian ini dijalankan melalui satu set soal selidik yang diedarkan kepada pekebun kecil di Muar, Johor. Maklum balas daripada 265 responden dianalisis dengan menggunakan SPSS. Penemuan kajian menunjukkan bahawa kualiti BTS dipengaruhi oleh tanah, proses pengendalian dan baja, aktiviti penuaian dan kualiti benih. Temubual juga dijalankan. Dari temu bual, antara lain, terdapat beberapa pekebun kecil yang memperoleh anak benih dari tapak semaian yang tidak berdaftar dan pekebun kecil tidak dapat menuai mengikut jadual. Ini memberi kesan kepada kualiti PBBS. Adalah disyorkan bahawa agensi-agensi seperti Lembaga Minyak Sawit Malaysia (MPOB) perlu mendidik pekebun kecil mengenai pentingnya benih yang baik dan mencadangkan teknologi penuaian baru yang sesuai yang dapat membantu pekebun kecil untuk mempercepatkan waktu penuaian. **Kata kunci:** Tandan Buah Segar (BTS), Tanah, Benih, Baja, Panen, Proses Pengendalian, Kadar Pengekstrakan Minyak (KPG)*

TABLE OF CONTENTS

DECLARATION	i
DEDICATION	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
ABSTRAK	v
LIST OF TABLES	ix
TABLE OF FIGURES	x
CHAPTER 1	1
INTRODUCTION	1
1.0 Background Study	1
1.1 Problem Statement	2
1.2 Research Questions	3
1.3 Research Objectives	3
1.4 Significant Study	3
1.5 Scope of Study	4
CHAPTER 2	5
LITERATURE REVIEW	5
2.1 Scenario of The Malaysia In Palm Oil Industry	5
2.2 Economic Background	7
2.3 Ownership	8
2.4 Government Schemes	10
2.5 Palm Oil Quality and Standards	10
2.6 Factors That Influence Oil Palm Fresh Fruit Bunches Productivity	11

2.7	Theoretical Framework	15
2.8	Summary	16
CHAPTER 3		17
METHODOLOGY		17
3.1	Methodology Choice	17
3.2	Data Collection Instrument	18
3.3	Research Strategy	18
3.4	Sampling Methods	20
3.5	Research Design	22
3.6	Pilot Test	24
3.7	Data Analysis	24
3.8	Summary	27
CHAPTER 4		28
DATA ANALYSIS AND FINDINGS		28
4.1	Pilot Test	28
4.2	Response Rate	29
4.3	Reliability Analysis	30
4.4	Descriptive Respondents	31
4.5	Inferential Analysis	34
4.6	Hypothesis Testing	39
4.7	Plans and Procedures to Improve Quality Of Fresh Fruit Bunches.	41
4.8	Summary	44
CHAPTER 5		45
CONCLUSION		45
5.1	Implication of Study	45

5.2	Limitation of Study	46
5.3	Recommendation of Study	47
5.4	Summary	47
REFERENCES		48
APPENDIX A		53

LIST OF TABLES

Table	Title	Page
Table 2.1	Distribution of Oil Palm Planted areas by sector in 1995 and 2017	8
Table 2.2	Number and Oil Palm Planted Area of Independent Smallholders	9
Table 2.3	Classification of bunches	11
Table 3.1	Krejcie & Morgan Table 1970	21
Table 3.2	Cronbach's Alpha Level of Consistency	26
Table 3.3	Pearson Correlation Coefficient	27
Table 4.1	Reliability Statistic Data for Pilot Test.	29
Table 4.2	Response Rate	29
Table 4.3	Case Processing Summary	30
Table 4.4	Reliability Statistics	30
Table 4.5	Demographic Analysis of Respondents	31
Table 4.6	Descriptive Statistics (Overall)	34
Table 4.7	The Result of Correlation Analysis	35
Table 4.8	Model Summary of Multiple Regression Analysis	36
Table 4.9	ANOVA Analysis	36
Table 4.10	Simple Regression between Dependent And Independent Variable	37

TABLE OF FIGURES

Figure	Title	Page
Figure 2.1	Percentage of FFB area Hectare In Malaysia	6
Figure 4.1	Plantations Area of Respondents	32
Figure 4.2	Metric Tons Per Month of Respondents Harvest.	33
Figure 4.3	Weighing Centre of Respondents	33

CHAPTER 1

INTRODUCTION

1.0 Background Study

In the year 1917, the first commercial-scale plantation in Malaysia was founded and established in Tennamaran Estate in Selangor. Since then, the demand for palm oil has increased as the palm oil can be used to produce soaps, lubricants and edible oils. Moreover, European settlers and entrepreneurs have recognized the opportunity for the increased income that can be generated from commercial palm oil production. As a result, this led to a dramatic expansion of oil palms plantations throughout Sub-Saharan Africa and Southeast Asia. Fresh Fruit Bunches (FFB) is the raw material for palm oil mills. The oil palm tree (*Elaeis guineensis*) originates from West Africa and was developed into an agricultural crop in Malaysia. The fruit from the tree is processed and has two main products crude palm oil and palm kernel.

In the report titled “Selected Agriculture Indicators, Malaysia, 2017” published in the year 2016 by the Department of Statistics Malaysia Official Portal, it is shown that the agriculture sector contributed to 8.1 percent or RM 89.5 billion to Gross Domestic Product (GDP). Although the percentage is small it is the main income provider to more than 650,000 people. Among the agriculture sector, oil palm contributes to 43.1% to the GDP. Other contributions from the agriculture sector are rubber (7.1%), livestock (11.6%), logging and forestry (7.2%), fishing (11.5%) and other agriculture (19.5%). In Malaysia, various organizations produce fresh fruit bunches. There are two smallholder types in Malaysia according to the Malaysian

Palm Oil Board (MPOB) that is the organized and unorganized smallholder. Organized smallholder is a smallholder registered under Malaysian Palm Oil Board (MPOB) such as the Federal Land Development Authority (FELDA), Federal Land Consolidation and Rehabilitation Authority (FELCRA) and Rubber Industry Smallholder Development Authority (RISDA). While the others are the unorganized smallholder. Although the numbers of independent smallholders are small, according to Rahman et al., (2008) the existence of independent smallholder is important and played a significant role in the development of oil palm. This is because if independent smallholders slacken in their operation and no improvement effort is made, it will give an effect to the overall supply chain because of their comparative cumulative size.

1.1 Problem Statement

In peninsular among the smallholder, Johor is the state that has a high productivity of fresh fruit bunches (FFB) with the largest number of independent smallholders. The plantation hectare at Johor area is 0.712 million hectares. However, the problem that governments must face from the FFB independent smallholder is the quality of the FFB does not meet the standards. It is seen that the percentage of FFB quality Oil Extraction Rate (OER) in palm oil industry performance has decrease from 2014(20.88%) to 2017(19.22%) (*MPOB OER Statistic*). This has led to poor income generation for the smallholder.

Thus, there is an urgent need to address this productivity problem and to improve the quality of the fresh fruit bunch (FFB) produced by smallholders, particularly independent smallholders. This study is conducted to identify issues that can improve the quality of the fruit fresh brunch (FBB). This can help in improving the productivity of the oil palm extraction and hence increase the income of independent smallholder. Moreover, it will help the economy of the country by improving the contribution of GDP from oil palm industry.

1.2 Research Questions

The research questions for this study are:

1. What is the critical success factor (CSF) that contribute to the quality Fresh Fruit Bunch?
2. What is the initiate/plan that can independent smallholder use to improve the Fresh Fruit Bunch quality?
3. What is the step/procedure independent smallholder can take to produce quality Fresh Fruit Bunch?

1.3 Research Objectives

The main research objectives for this study are:

1. To identify the critical success factors (CSF) that affect the quality of the palm oil Fresh Fruit Bunch.
2. To identify the initiative/plan that is used to improve Fresh Fruit Bunch quality.
3. To recommend the steps/procedures that can help independent smallholders to obtain produce quality Fresh Fruit Bunch.

1.4 Significant Study

It is hoped that the study of palm oil fresh fruit bunch (FFB) for independent smallholder in Muar area of Johor can provide information about how to improve the quality of fresh fruit bunches (FFB) and factors that affect the quality of fresh fruit bunches (FFB). The purpose of the study was to provide information and to assist independent smallholders to improve the quality of fresh fruit bunches (FFB).

In terms of practical perspective, this study was conducted to assist independent smallholders to reduce their quality of the FFB degradation problems that occurred

from 2014 to 2017. Additionally, this study can help provide more in-depth knowledge to independent smallholders about the process to produce quality fresh fruit bunches and factors that affect the quality of the fruit.

Furthermore, through this research, this study can help the government to address the problems faced by independent smallholders in Malaysia. In this way, the government can find ways to assist independent smallholders to improve the quality of fresh fruit bunches (FFB).

1.5 Scope of Study

The study focused on the smallholder at Muar, to identify the factors that caused the quality of fresh fruit bunches (FFB). The study was conducted in Johor which is the largest producer of fresh fruit bunches certified by MPOB. Furthermore, our study was focused in Muar because this is a village area with the majority of the population which works as an independent smallholder.

Independent smallholders in the study are customers of Pertubuhan Peladang Kawasan Muar Selatan (PPKMS). Pertubuhan Peladang Kawasan Muar Selatan is a partially governmental divisional and a collection center for the Muar area. Pertubuhan Pladang Kawasan Muar Selatan is the firm that is appointed by the government to collect the number and buy the fresh fruit bunches from the smallholder area Muar Selatan, smallholder that has registered under Pertubuhan Peladang Kawasan Muar Selatan are 832 smallholders and 880 are independent smallholders.

CHAPTER 2

LITERATURE REVIEW

Independent smallholders have been identified as one of the effective mechanisms to promote rapid economic growth to a country in the palm oil sector. With the growth of this sector in Malaysia, it can help open job opportunities to locals and can indirectly help increase the Country's revenue and individual income. This chapter will provide a scenario of the Malaysia palm oil industry. It will also provide the factor that controlled to the quality of FFB that are focused in version smallholder.

2.1 Scenario of The Malaysia In Palm Oil Industry

Malaysia is a developing country with very high yields of palm oil. Since 20th-century palm oil plantation has been a backbone of the Malaysia economy (Henson, 1999). Malaysia has many agency and smallholder that help to supply the palm oil fruits. Smallholders can be dividing into two types of smallholder which are the organized smallholder and the unorganized smallholder. Organized smallholder is the formal participant that has been under the Federal Land Development Authority (FELDA), Federal Land Consolidation and Rehabilitation Authority (FELCRA) and Rubber Industry Smallholder Development Authority (RISDA). While the unorganized smallholder is the farmer that did not participate under a formal organization and that is the reason why we call them as an independent smallholder (Rahman et al., 2008). Independent smallholder is one sector that help to supply the fresh fruit bunches (FFB) for the mills.

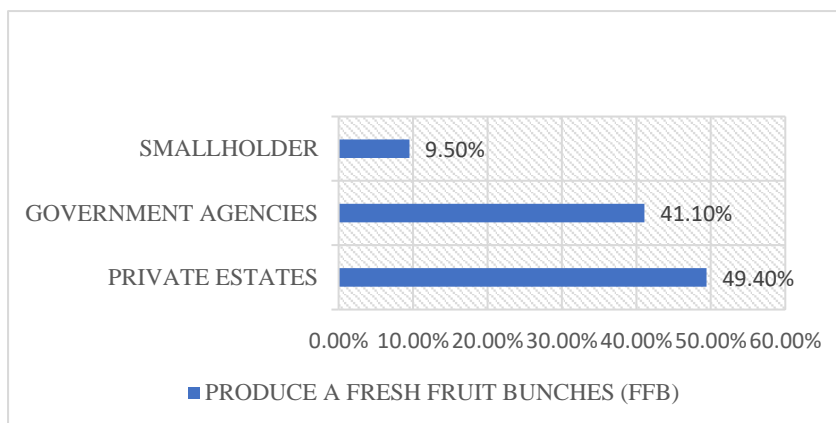


Figure 2.1: Percentage of FFB area hectare in Malaysia (MPOB statistical, 2010)

Based on Figure 1.0, the largest producer of fresh fruit bunches (FFB) in Malaysia is Estate, which is run under the management of a private corporation of 49.4%. The estate is a private corporation that manages the largest agricultural sector in Malaysia, its anthrax is Sime Darby. Meanwhile, followed by government agencies such as FELDA, FELCRA, SALCRA, SLDB, and RISDA by 41.1% and an independent smallholder of 9.5%.

The quality of fresh fruit bunches (FFB) will be determined through the oil extraction rate (OER). Percentage of FFB quality Oil Extraction Rate (OER) in palm oil industry performance has decreased time by time. This quality decline can be attributed to the issues often faced by all the supply of palm fruit. A study by Azman et al., (2014), was being compared with an organized smallholder. Independent smallholder is often associated with very well-known issues in the palm oil industry such as the low yielded fruit (FFB) yield, oil extraction rate (OER) which are low and lack of enough knowledge and adequate training of agriculture. Moreover, the lack of knowledge and money make independent smallholders produce a low quality of fresh fruit bunch. It is because, besides buying their seedlings they also suspended to raise capital for fertilizer (Mahbob, 2010).

2.2 Economic Background

Agricultural plants in Malaysia have helped generate high income for the country's Gross Domestic Product (GDP). Crops such as, palm oil, rubber, livestock, logging, forestry, and fishing has helped increase the country's revenue. Among these six crops, the palm oil industry is the main industry in the crop subsector with the involvement of 5,386 establishments. Oil palm also contribute to a gross output value in 2015 of RM47,162.6 million, and increase to 6.3 percent per annum from RM34,699.6 million in 2010. From the statistical estimate of the Malaysian statistics department, the value has incremental increase for the palm oil industry from 2010 to 2015 is RM32,477.5 million (Gross Domestic Product (GDP), 2017)

In 2016, the agriculture sector in Malaysia was export and import the product in amount RM115, 844billion, and RM8, 6673billion with trade balance RM31, 172billion. The export and import percent process increased from 2015 to 2016 with export (5.4%) and import (0.9%). This sector can help GDP to collect the income to help the country to pay the debt. This sector also can help people in the country to gain income by being a smallholder. The statistic in the Department of Statistics Malaysia Official Portal shown the number of smallholders in the agriculture sector in 2016 is 1,609.9 thousand people.

Increasing the demand for fresh fruit bunch (FFB) at the market can help to increase the independent smallholder income. The low-quality independent smallholder fresh fruit bunch (FFB) has a negative correlation with the level of income and welfare of farmers. The previous research had said that the selling price of the palm oil fruits per month is depended on the quality of the fresh fruits bunch (Zahri, 2003).

2.3 Ownership

According to Mohd Jaafar (1994), Malaysia was introduced to a palm oil plantation earlier in the year 1917, it was the prime crop choice for the diversification program. Malaysia has many palm oil sectors that supply chain the fresh fruit bunches (FFB). There are two types of smallholder named the organize smallholder and the unorganized smallholder (Rahman et al., 2008). The ownership under an organize smallholder is a Federal Land Development Authority (FELDA), Federal Land Consolidation and Rehabilitation Authority (FELCRA), and Rubber Industry Smallholder Development Authority (RISDA), while the latter consists of unorganized smallholder.

Table 2.1: Distribution of oil palm planted areas by sector in 1995 and 2017(MPOB Statistic,2017)

Category	YEAR			
	1995		2017	
	Area (Ha)	%	Area (Ha)	%
Private estates	1, 255, 466	49.4	3, 543, 429	61.0
Federal government schemes:				
Felda	675, 392	26.6	704, 811	12.1
Felcra	132, 198	5.2	169, 158	2.9
RISDA	41,571	1.7	66, 357	1.1
State/ Govt. agencies	193, 468	7.6	347, 632	6.0
Smallholder	241,992	9.5	979, 758	16.9
Total	2, 540, 087	100	5, 811, 145	100

Many smallholders are now organized smallholder had registered under government agencies (Simeh and Ahmad ,2001). However, FELDA scheme for palm oil started in 1961 with 375 hectares of land where the rubber scheme started in 1957 with 1,620 hectares (Shamsul and Thong, 1988). RISDA is the only organized smallholder

that provides replanting funds for rubber smallholders, but they were switched to the palm oil industry (Simeh and Ahmad (2001).

The purpose of FELDA moving towards oil palm is to help the independent smallholder to increase their income. The criteria selected to participate in the FELDA land schemes is the age bracket of 21-25 years are married and physical fit (Simeh and Ahmad (2001). According to Shamsul and Thong (1988), the resulting income of the participate in FELDA land schemes from the year 1980 to 2000 has increase and has better off earning income for smallholder.

Table 2.2: Number and Oil Palm Planted Area of Independent Smallholders in Malaysia, 2017(MPOB Statistic, 2017)

State	Number	%	Area (ha)	%
Johor	76, 463	30.7	223, 424	22.8
Perak	44, 214	17.8	123, 511	12.6
Selangor	21,719	8.7	46, 386	4.7
Pahang	11, 966	4.8	51, 462	5.3
Kedah	5, 832	2.3	26, 650	2.7
Negeri Sembilan	5, 586	2.2	26, 090	2.7
Terengganu	3, 327	1.3	12, 922	1.3
Melaka	2, 918	1.2	12, 675	1.3
Pulau Pinang	1,853	0.7	9, 303	0.9
Kelantan	1, 735	0.7	5, 977	0.6
Perlis	17	0.0	90	0.0
Peninsular Malaysia	175, 630	70.5	58, 490	55.0
Sabah	35, 342	14.2	221,139	22.6
Sarawak	38, 057	15.3	220, 129	22.5
Sabah and Sarawak	73, 399	29.5	441, 268	45.0
Malaysia	249, 029	100	979, 758	100

The existence of independent smallholders is important, and they also have their main role in the development of the agriculture sector. Statistics showed that the scale of several independent smallholders is a smaller scale compared to the organize smallholder. However, if the independent smallholder fresh fruit bunch (FFB) slacken in operation and no correction effort is made, this quality of the fresh fruit bunch (FFB) will affect the overall supply chain because the independent smallholder cumulative size is comparatively large (Rahman et al., 2008). It is show

that, the number of independent smallholders in Peninsular Malaysia in the year 2007 is only 120 341 people, but in 2017 it has increased to 176 530 people of independent smallholder (MPOB statistic 2007).

2.4 Government Schemes

According to Suryani et al., (2016), the government play an important role to help increase the quality in the palm oil industry. The government role is to help and guide the farmers to produce a good quality of palm oil fruits. According to Nagiah and Reza (2012), a scheme for smallholders is structurally bound by credit agreement to a mill. From the scheme, smallholder received the seedling, fertilizers, pesticides, and access to technical assistance or credit

Malaysia has launched Wild Asia Group Scheme (WAGS) to help the farmer since 2010. The purpose of the scheme is to field testing a new group as a platform that provides support to independent smallholders to get a good quality of fruits and to develop new ways to organize, support and market small farmers to a global (Nagiah and Reza, 2012).

2.5 Palm Oil Quality and Standards

Oil palm trees have a monoecious crop as it bears both male and female flowers in the same plant. Each oil plant tree can produce around 1000 to 3000 fresh fruit bunches and each fruit can produce compact bunches of 10 to 25kg (Zulkifli et al.,2010). Table 2.3 shows the classification of FFB. It indicates the quality of the FFB.