

Analysis of Oil Palm (*Elaeis guineensis* Jacq.) Harvest Management and Crude Palm Oil (CPO) Marketing Strategies at the Oil Palm Plantation Company PT Sampoerna Agro Tbk

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Abstract. *Oil palm is a plant species of the Arecaceae family capable of producing edible vegetable oil. Oil palm produces two different types of oil: CPO (Crude Palm Oil) and PKO (Palm Kernel Oil). This study aims to examine oil palm harvest management and CPO marketing strategies implemented at PT. Sampoerna Agro Tbk in South Sumatra. The research method used in this study is the quantitative descriptive method. The results indicate that the harvest management component tested using a t-test showed no significant effect at the 5% level. Based on the SWOT analysis of the IFAS and EFAS factors, it is evident that these factors significantly influence the marketing strategies implemented by the company.*

Keywords: *Oil Palm, Harvest Management, Marketing Strategies.*

1. Introduction

Oil palm (*Elaeis guineensis* Jacq) is a crop that produces vegetable oil for food products, industrial oils, and biofuels (biodiesel) (Ogi Prayuda et al., 2022; Teoh, 2012). The wide variety of palm oil (PO) derivative products gives this crop strategic value and makes a significant contribution to Indonesia's export revenue (Ogi Prayuda et al., 2022). Indonesia is the world's largest producer of palm oil. The USDA (United States Department of Agriculture) estimates that Crude Palm Oil (CPO) production in Indonesia could reach 45.5 million metric tons (MT) in 2022–2023. The high contribution of the palm oil sector to the national economy requires proper maintenance management to ensure sustainable productivity (Lubis et al., 2022).

High production must be supported by good cultivation techniques. An important cultivation technique in oil palm is harvest management. Achieving high production begins with the nursery stage to ensure optimal planting material (Khairiah, 2013; Afrillah et al., 2020). The quality of CPO is highly dependent on the quality of fresh fruit bunches (FFB) entering the palm oil mill (POM). A POM can produce high-quality oil if the raw material input is of high quality (Tuty et al., 2021).

A successful harvest supports crop productivity, making oil palm harvesting one of the most critical activities in oil palm plantation management. The objective of harvesting is to obtain ripe, high-quality oil palm fruits, thereby maximizing the potential yield of oil and kernels. Oil palm harvesting activities include cutting ripe fruit bunches, picking the fruit, cutting the fronds, transporting the fruit to the collection point, and sending the fruit to the oil palm mill (Pardamean, 2017).

In addition to the harvesting process, which ultimately supports the production of fresh fruit bunches (FFB) by the company, the process must comply with national standards, such as standard operating procedures and quality criteria for harvesting

including ripe fruit, underripe fruit that is not too hard, and fully ripe fruit. However, the current implementation of oil palm sorting does not align with existing standards, thereby affecting the quantity of the final product. Consequently, the company frequently faces challenges in meeting its monthly production targets (Bunthang, 2021).

Strategy is fundamental to every company's organizational success. According to Nurzam (2020), a company's marketing strategy must address matters such as analyzing market opportunities, formulating marketing strategies, planning marketing programs, and coordinating marketing efforts. Marketing strategy is one of the tools for achieving a company's long-term goals.

As a company with a clear vision and mission, PT. Sampoerna Agro Tbk. should formulate an appropriate marketing strategy for its palm oil marketing operations. It is the large volume of CPO (Crude Palm Oil) sales by PT. Sampoerna Agro Tbk. that prompted the researcher to select it as the subject of this study, with the aim of examining the company's oil palm harvest management and CPO marketing strategies.

2. Method

This research method is a quantitative study, which is a research method based on the philosophy of positivism, used to study a specific population or sample, data collection employs research instruments, and data analysis is quantitative/statistical, with the aim of testing the established hypotheses (Sugiono, 2013).

According to Ardianto (2010), quantitative research is research that relies heavily on numerical data collected through field data collection techniques. In data analysis, quantitative research methods require the application of statistical techniques, including both descriptive and inferential statistics, which utilize non-parametric statistical formulas. The conclusions drawn from the research consist of descriptive calculations or the interrelationships between variables. The research instruments used are observational tools or direct field observations.

The data analysis technique used involves presenting data in the form of organizing the information that has been collected. This presentation can take the form of narrative text (in the form of field notes), matrices, graphs, networks, and charts. The data analysis process for the marketing strategy involves a SWOT analysis, which examines internal strategic factors (IFAS) as well as external strategic factors. Internal factors consist of strengths and weaknesses, while external factors consist of opportunities and threats to the company. The variables to be observed in harvest management activities include crop rotation, crop density (AKP), fruit yield estimation, labor requirements for harvesting, harvest maturity criteria, and fruit quality.

3. Results and Discussions

Harvest management

Harvest management encompasses all the steps that must be taken during the harvesting process to ensure that the harvested Fresh Fruit Bunches (FFB) have a high oil content and good quality, characterized by low free fatty acid (FFA) levels.

Crop Rotation

Crop rotation refers to the time interval between the current harvest and the next harvest. The crop rotation used in the IHET Division of the Hikmah Empat plantation at PT. Sampoerna Agro Tbk is a 7-day cycle; however, achieving a strict 7-day rotation is difficult. The company grants flexibility to each division so that each block can be

harvested three times a month, or the crop rotation can extend to 8 to 10 days depending on the division's size. The IHET Division divides the harvest blocks into 9 harvest sections, so each day one harvest section must be completed to ensure the target of harvesting one block three times a month is met. Factors influencing the harvest rotation include the Harvest Density Rate and Harvester Capacity.

Table 1. Crop rotation in the IHET division

No.	Week	Company Standard	Shortest	Longest
1	Week 1	9 days	8 days	12 days
2	Week 2	9 days	8 days	9 days
3	Week 3	9 days	8 days	9 days
4.	Week 4	9 days	10 days	11 days

AKP Results (AKP)

The Harvest Density Index is the percentage of ripe fruit relative to the total number of plants to be harvested the following day. This activity is carried out by taking samples from a harvest area at row numbers 20, 40, 60, 80, 100, and 120. Count the number of ripe clusters on each plant in the surveyed rows. Record the number of ripe bunches and the number of plants surveyed in the Harvest Density Data. This activity is conducted one day before the harvest takes place to ensure the accuracy of the data. The formula for calculating the Harvest Density is as follows:

$$\text{AKP} = \frac{\text{Number of ripe bunches}}{\text{Total census base}} \times 100\%$$

Here are the results of the AKP's tally

Table 2. AKP Results

No.	Day	Census item	Ripe fruit	AKP	Actual
1	Monday	163 Items	34 Bunches	20 %	20 %
2	Tuesday	154 Items	32 Bunches	20 %	30 %
3	Wednesday	92 Items	21 Bunches	22 %	23 %
4.	Thursday	106 Items	31 Bunches	30 %	25 %
5.	Friday	158 Items	32 Bunches	20 %	20 %
6.	Saturday	161 Items	53 Bunches	32 %	32 %
	Average	137 items	33 Bunches	24% ^a	32% ^a

The results of the t-test comparing the estimated AKP with the actual AKP showed no statistically significant difference at the 5% level. This indicates that the calculated AKP does not differ significantly from the actual results.

Fruit Harvest Estimation

Fruit yield estimation is the method and process used to determine estimated production, harvester requirements, and the number of fresh fruit bunches (FFB) transport vehicles needed for a single day's harvest. In other words, fruit yield estimation can also be defined as the process of predicting the tonnage to be produced for the next day's harvest. Fruit yield estimation is determined based on the area of the block to be harvested, the harvest density, and the Average Cluster Weight (ACW) of fresh fruit clusters. The following is the fruit harvest estimate data for the IHET division:

Table 3. Fruit Harvest Estimates

No.	Day	Area (ha)	BJR (kg)	AKP (%)	Number of bunches	Estimated (kg)	Actual (kg)
1	Monday	65.50	10	20 %	2.800	28.000	25.430
2	Tuesday	62.18	10	20 %	2.266	22.660	28.230
3	Wednesday	62.74	10	22 %	2.963	29.630	30.120
4.	Thursday	35.65	10	30 %	1.824	18.240	17.430
5.	Friday	70.17	10	20 %	3.219	32.190	29.340
6.	Saturday	71.83	10	32 %	2.746	27.460	29.230
	Average	61,345	10	24%	2.636	26.363 ^a	26.630 ^a

The results of the t-test in Table 3, which compares estimated tonnage with actual tonnage, show no significant difference at the 5% level. This indicates that the estimated tonnage does not differ significantly from the actual harvest tonnage.

Labor Requirements for Harvesting

The harvest crew in the IHET division is divided into two teams led by Harvest Foreman Bambang and Harvest Foreman Kasiyanto, with a total of 30 harvesters.

Table 4. Number of harvest workers

No.	Foreman's Name	Commander's Number	Permanent Daily Employees	Casual Workers	Number of Harvest Workers
1	Kasiyanto	Ihee20009	9 people	7 people	16 people
2	Bambang	Ihee20004	7 people	7 people	14 people
	Total		16 people	14 people	30 people

The number of harvest workers must be adjusted to the size of the area to be harvested so that the harvest can proceed smoothly and there is neither a shortage nor a surplus of workers. The number of harvest workers required can be determined based on the area size, the number of plants per hectare (SPH), the harvest density, the target harvest yield, and the average fresh fruit bunch (FFB) weight. The method for calculating the harvesting labor requirements in the IHET division is as follows:

$$\text{Labor requirements for harvesting} = \frac{\text{AKP} \times \text{SPH} \times \text{Area} \times \text{BJR}}{\text{Harvest Basis}}$$

Formula Notes

AKP : Harvest Density
 SPH : Basic Unit/ha = 135
 BJR : Average Cluster Weight = 10 kg
 Harvest Basis : 1300 kg

Table 4 shows that the IHET Division has two types of employees: Permanent Daily Employees (KHT) and Casual Daily Employees (KHL), numbering 16 and 14, respectively, from the two existing work units.

Table 5. Labor requirements for harvesting

No.	Harvest Day	Daily Schedule	Attendance Record
1	Monday	23 people	24 people
2	Tuesday	24 people	25 people
3	Wednesday	27 people	25 people
4.	Thursday	17 people	14 people
5.	Friday	26 people	26 people
6.	Saturday	25 people	25 people
	Average	23 ^a	23 ^a

The author's observations and the t-test in Table 5, which compares daily plans with actual attendance, show no significant effect at the 5% level. This indicates that the projected labor requirements for harvesting activities can proceed according to the established plans.

Harvest Maturity Criteria

Harvest maturity criteria refer to the physical characteristics of fresh oil palm fruit bunches used as a benchmark in harvesting operations. By applying these criteria, we can identify unripe fruit, normally ripe fruit, overripe fruit, and rotten fruit. The following are the harvest maturity criteria applied at PT. Sampoerna Agro Tbk:

Table 6. Criteria for fruit ripeness

No.	Faction	Maturity criteria	Number of loose berries
1	F00	Unripe	< 5 grains
2	F0	Normally ripe	< 50% chaff
3	-	Overripe	>50% chaff
4.	-	Rotten bunch	100% chaff

Marketing Strategy of PT. Sampoerna Agro Tbk

Segmenting

PT. Sampoerna Agro Tbk has two key segments in the implementation of its marketing strategy, namely:

1. The CPO Industry

PT Sampoerna Agro Tbk is one of the largest CPO producers in Indonesia, as it owns extensive oil palm plantations spread across various regions in the country. The fresh fruit bunches (FFB) produced at each plantation are processed in-house at the company's own mills. The mills enforce a policy requiring that fruit delivered to the facility must comply with the mill's established Standard Operating Procedures (SOPs): the fruit must have shed more than 10 seeds, and the mill does not accept overripe or rotten fruit. Through the implementation of these policies, the hope is that PT Sampoerna Agro's palm oil mills can produce high-quality CPO.

2. CPO Export Activities

The CPO produced by the palm oil mill will be exported overseas, particularly to Southeast Asia; therefore, the exported CPO must be of the highest quality.

Targeting

PT. Sampoerna Agro Tbk aims to become the leading and largest supplier of CPO in Southeast Asia, in order to further increase the company's profits.

Positioning

PT. Sampoerna Agro Tbk is a major company operating in the palm oil industry with operations spread across several regions in Indonesia, including South Sumatra, Central Kalimantan, West Kalimantan, Papua, and Riau.

SWOT Analysis**IFAS Matrix (Internal Factors Analysis Summary)**

Through the internal environmental analysis conducted by the author, several strengths and weaknesses of PT. Sampoerna Agro Tbk can be identified, including:

1. Company Strengths (Straight)
 - a. Possesses extensive plantation land.
 - b. Operates its own palm oil mill.
 - c. Sound financial management.
 - d. Well-coordinated workforce management.
 - e. Human Resources
2. Company Weaknesses
 - a. The plantations are located far from the headquarters.
 - b. The access roads to the plantations are still in poor condition.
 - c. Internet connectivity is still weak.
 - d. Employee discipline is lacking.
 - e. Police security is still inadequate.

Table 7. SWOT Analysis: IFAS

No.	IFAS Factor/ Strength	Weight	Rating	Score
1	Plantation Area	0.106	8	0.848
2	Palm Oil Mill	0.093	6	0.558
3	Financial Management	0.097	8	0.776
4.	Labor Management	0.100	8	0.800
5.	Human Resources	0.112	8	0.896
No.	IFAS Factor/ Weakness	Weight	Rating	Score
1	Farm Location	0.096	2	0.192
2	Production Process	0.101	3	0.303
3	Internet Connection	0.095	2	0.190
4.	Discipline	0.103	3	0.309
5.	Security	0.097	3	0.291
Total		1.00		5.163

From the table above, it can be seen that PT. Sampoerna Agro's primary strength lies in its human resources, with a total score of 0.896, while its primary weakness is discipline, with a score of 0.309. These two IFAS factors are particularly significant and influential for the company, as the total score obtained is above 4.0.

EFAS Matrix (External Factors Analysis Summary)

1. Opportunities for the Company
 - a. Its extensive land area positions PT. Sampoerna Agro Tbk as one of the largest CPO producers in South Sumatra compared to other companies in the region.
 - b. Each factory owned by PT. Sampoerna Agro Tbk is permitted to receive fruit from a maximum of three plantations. This policy aims to better monitor which plantations produce high-quality fresh fruit bunches (FFB) and which do not. The mills will also not accept fruit from other companies or from community plantations, ensuring that the CPO produced is 100% sourced from PT. Sampoerna Agro Tbk's own plantations.
 - c. Sound financial management can be a key factor in the company's long-term sustainability.
2. Threats to the Company
 - a. Urgent requests that cannot be sent via email will be difficult to address due to the remote location of the plantations in OKI District, while the headquarters in Palembang City is a 5- to 6-hour drive away. This can hinder work processes.
 - b. The roads in the plantations are still in poor condition, especially when it rains; this can severely disrupt the transportation of fruit to the oil mill. Fruit that cannot be transported on the day of harvest will become leftover fruit, and fruit left in the plantation overnight will affect the free fatty acid content of the CPO produced later.
 - c. Internet connectivity significantly impacts the division clerks' ability to submit work reports from each division to headquarters; this process is hindered if the internet connection is poor.
 - d. Poor discipline among employees can hinder the completion of tasks.
 - e. Inadequate security from the police often results in the plantation losing bunches of fresh oil palm fruit due to theft by local residents who do not work for the company.

Table 8. SWOT Analysis: EFAS

No.	EFAS Factor/ Opportunities	Weight	Rating	Score
1	Highest CPO	0.105	8	0.840
2	High-Quality CPO	0.113	7	0.791
3	Work Motivation	0.093	5	0.465
4	Work Runs Smoothly	0.097	5	0.485
5	No Tasks Are Overlooked	0.100	6	0.600
No.	EFAS Factor/ Threat	Weight	Rating	Score
1	Administrative Delays	0.097	4	0.388
2	Increased ALB	0.103	5	0.515
3	Division Management	0.096	4	0.384
4	Working Hours	0.095	3	0.285
5	Loss of Fresh Fruit Bunches	0.101	3	0.303
Total		1.00		5.056

From the table above, it can be seen that the primary opportunity for PT. Sampoerna Agro lies in CPO (Crude Palm Oil), with a total score of 0.840, while the primary threat is the rise in ALB (Asian Long-horned Beetle), with a score of 0.515.

4. Conclusions

Through this study, the author has drawn several conclusions, including the following.

1. Based on the results of the t-test for the management section, there was no significant effect at the 5% level.
2. Good harvest management helps a division complete harvesting activities effectively and efficiently.
3. The SWOT analysis the author conducted on the IFAS and EFAS factors indicates that PT. Sampoerna Agro Tbk is in a strong internal and external position with scores of 5.163 and 5.056, meaning the company should maintain and sustain the strategies already in place.

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