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STRATEGY TO INCREASE PRODUCTIVITY OF 20-25 YEAR AGE PALM OIL PLANTS AT PT.PP LONDON SUMATRA BAGERPANG ESTATE

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Abstract

This study aims to formulate a strategy to increase the productivity of oil palm plantations at PT PP London Sumatera Bagerpang Estate. The study was conducted from November 2025 to April 2026 using a qualitative descriptive method supported by a SWOT analysis. Data collection was conducted through field observations, interviews with plantation management and employees, and secondary data in the form of production data, plant population, fertilization, pest and disease control, and harvest reports. Data analysis was carried out by identifying internal and external factors using a SWOT matrix. The results showed that the actual productivity of oil palm plantations in 2025 decreased by 2.02 tons/ha . The main strength factors consisted of the application of rorak and mounding (score 0.84), the availability of heavy equipment (0.48), and accurate plantation administration (0.23). Weakness factors included low Stand Per Hectare (SPH) (0.49), minimal technical supervision (0.39), and inadequate water gate conditions (0.34). Meanwhile, the main opportunities come from the availability of local labor (0.90) and the proximity of the area to water sources (0.49). The results of the SWOT analysis place the company in Quadrant IV (defensive strategy) , so the recommended strategy is to maintain SPH through *mounding activities,* rorak construction , water gate repair , optimization of mechanical maintenance, and community involvement in garden maintenance activities. The implementation of this strategy is projected to increase average productivity from 14.99 tons/ha to 20.58 tons/ha , or an increase of 4.20 tons/ha .

Keywords: productivity, oil palm, SWOT analysis, improvement strategy, plantation management.

INTRODUCTION

Productivity is the ability to produce optimal output through the effective and efficient utilization of available production resources. In the palm oil plantation industry, productivity is a key indicator of a company's success in achieving production targets, and therefore needs to be continuously improved through sound crop management (Sufandi, 2025). Productivity increases are implemented when there is a gap between actual production results and the standard or potential production that should be achieved. This condition is of particular concern for oil palm plants entering the mature to old phase, as productivity tends to decline at a certain age.

At PT PP London Sumatera Bagerpang Estate, several blocks of 20, 21, and 23-year-old plantations have shown a declining productivity trend over the past three years. This decline not only affects production yields in specific blocks but also impacts the overall productivity of the plantation. Based on the potential for oil palm production by plant age compiled by PPKS (2009), the productivity of 21–25-year-old plantations is 25.5 tons/ha, 25.0 tons/ha, 24.0 tons/ha, 23.0 tons/ha, and 22.5 tons/ha, respectively, on land with suitability classes S1, S2, and S3. These data indicate that as the plant ages, productivity naturally decreases, requiring more intensive management to maintain production.

Efforts to increase productivity can be undertaken if annual production results are still below established standards. Various strategies that can be implemented include the implementation of *Good Agricultural Practices* (GAP), such as timely and appropriate fertilization, efficient irrigation management, regular replanting, pest and disease control, and the use of technology and innovation in cultivation activities. Based on the production report of PT PP London Sumatera Bagerpang Estate, plant productivity in the 20–23 year age group has decreased by 3.48 tons/ha in the last three years. This decline causes actual productivity to be below the production standards for oil palm plants aged 21–25 years, so it is necessary to evaluate the factors influencing the decline in productivity and implement more effective production increase strategies (Sufandi, 2025; PPKS, 2009).

LITERATURE REVIEW

Oil Palm Plant Productivity

Productivity is a measure of efficiency that shows the comparison between the results (*output*) obtained and the resources (*input*) used in the production process (Parung, 1999). In oil palm plantations, productivity is expressed as the number of fresh fruit bunches (FFB) produced per unit area of land in one year (tons/ha/year), making it one of the main indicators in assessing the success of crop management (Mhd Kholil, 2023). Productivity not only reflects the size of the harvest, but also shows the effectiveness and efficiency of resource utilization used. Therefore, increasing productivity is a primary goal in plantation management because it is directly related to production performance and the sustainability of the plantation business.

Factors Affecting Oil Palm Productivity

Oil palm productivity is influenced by various interrelated factors, including genetics, plant age, environmental conditions, and cultivation techniques. Genetic factors relate to the use of superior seeds with high production potential, while environmental factors include land suitability, rainfall, soil conditions, and topography that support plant growth. Cultivation techniques include fertilization, plant maintenance, pest and disease control, and harvesting, all carried out according to operational standards. Good cultivation practices will support plant growth, thereby maintaining optimal productivity (Yalisan, 2021).

Among these factors, plant age is one of the most important determinants of oil palm productivity. Plants begin producing at around 3–4 years of age, reach optimum productivity at 9–14 years of age, and then decline after reaching 20 years of age due to a decline in the plant's physiological ability to produce fresh fruit bunches (Hayata, 2020). Furthermore, good land suitability will increase production potential, while ideal rainfall of around 2,000–2,500 mm per year is needed to support optimal growth and fruit formation (Riyandani, 2016; Wiwin, 2024). The application of cultivation techniques, particularly fertilization according to the 5T principle (correct type, correct dose, correct time, correct place, and correct method), also contributes to increased oil palm productivity (Panggabean & Purwono, 2022; Budiargo et al., 2020).

METHODS

This research was conducted at PT PP London Sumatera Bagerpang Estate from November 2025 to April 2026. The study used a qualitative descriptive approach to identify factors influencing oil palm productivity and to formulate productivity improvement strategies. The study population included all management and executive employees involved in plantation operations. The sample was selected using a purposive sampling technique based on the consideration that respondents have knowledge and direct involvement in oil palm management (Sugiyono, 2017).

The data used consisted of primary and secondary data. Primary data were obtained through field observations and interviews with managers, assistant managers, garden assistants, foremen, and field workers. Meanwhile, secondary data were obtained from company documents, including data on plant productivity, plant age, seedling variety, population size, fertilization records, and pest and disease control. Observations focused on 21–25-year-old plantation blocks that had experienced a decline in productivity over the past three to five years.

Data analysis was conducted using a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis to identify internal and external factors affecting oil palm productivity. Internal factors were analyzed based on strengths and weaknesses, while external factors were analyzed based on opportunities and threats. The analysis results were then mapped into SWOT quadrants to formulate the most appropriate productivity improvement strategy for PT PP London Sumatera Bagerpang Estate (Rangkuti, 2015).

RESEARCH RESULT

Internal Factor Analysis

In formulating a strategy based on internal factor analysis, researchers conducted an internal analysis, namely analyzing *strengths* and *weaknesses* . Based on the results of interviews and observations, the following internal factors were identified.

Table 1. Internal Factors (*Strength*)

No	Strength	Score
1	The condition of the heavy equipment is sufficient to carry out soil structure repairs, *mounding processes* and making rorak.	0.48
2	The garden plant administration data report is accurate and complete so that the technical execution process will be more accurate.	0.23
3	The process of making rorak and *mounding* is an effort to maintain water availability and prevent trees from falling.	0.84

Based on the results of the SWOT analysis, three strengths were identified *that* support increased productivity at PT PP London Sumatera Bagerpang Estate. First, the availability of adequate heavy equipment allows all maintenance activities to be carried out mechanically, such as clearing bushes, applying fertilizers, and maintaining harvest roads. The use of *mini excavators* and *mini tractor dumpers* increases work efficiency and minimizes the loss of loose fruit during harvest. Second, plantation administration integrated with *Geographic Information System* (GIS) technology produces more accurate crop data and block mapping, facilitating planning, monitoring, and implementing operational activities. Third, the implementation of soil and water conservation through the construction of rorak and *mounding* plays a role in maintaining water availability during the dry season and maintaining the stability of plants affected by ganoderma disease. These three factors are the main strengths supporting the increase in productivity of the Bagerpang plantation.

Next, the results of the identification of weakness factors *are* presented in Table 2.

Table 2. Internal Factors (*Weaknesses)*

No	Weakness	Score
1	Low SPH so that the resulting fruit production will be far from the production potential.	0.49
2	Minimal technical supervision where supervisory staff are currently being transferred to the *replanting process.*	0.39
3	*Water gates* are not sufficient, especially in areas close to rivers.	0.34

Based on the SWOT analysis, three main weaknesses *contributed* to the decline in productivity at PT PP London Sumatera Bagerpang Estate. First, low Stand Per Hectare (SPH) due to a reduced plant population, directly reducing potential production per hectare. SPH below 80% has been reported to reduce productivity by up to 50% due to a reduction in the number of productive plants (Gunawan et al., 2021). Second, minimal technical supervision resulting from the *replanting program* resulted in a greater focus on rejuvenation, reduced monitoring of plant maintenance, and reduced productivity. Third, unrepaired *water gate damage* resulted in flooding in some areas, stressing the plants. This condition can inhibit the formation of female flowers and increase the formation of male flowers, ultimately potentially reducing fresh fruit bunch production in the following period (Lai JW, 2023).

External Factor Analysis

In formulating a strategy based on external factor analysis, researchers conducted an external analysis, namely by analyzing *Opportunity* and *Threats factors* . Based on the results of interviews and observations, the following internal factors were obtained.

Table 3. External Factors *(Opportunity)*

No	Strength	Score
1	High human resources outside the plantation so there is an opportunity to carry out contracting for technical maintenance work	0.90
2	The area is close to the river so that the process of making rorak is more profitable.	0.49

Based on the SWOT analysis, two opportunity factors *with* the highest scores have the potential to support increased productivity at PT PP London Sumatera Bagerpang Estate. First, the availability of human resources (HR) from the surrounding community provides an opportunity for the company to utilize contract labor for manual technical tasks, such as disk maintenance and weed control. In addition to improving operational efficiency, community involvement can also strengthen the relationship between the company and the community

(Helviani, 2021). Second, the plantation area's proximity to a river provides the potential to ensure water availability, especially during the dry season. This situation can be utilized to support water management through *water gate repairs* and various technical activities in the field, thereby maintaining crop productivity.

Productivity Improvement Strategy

Based on the internal and external analysis conducted, strategies for increasing productivity can be formulated. These strategies consist of four strategic combinations, as follows.

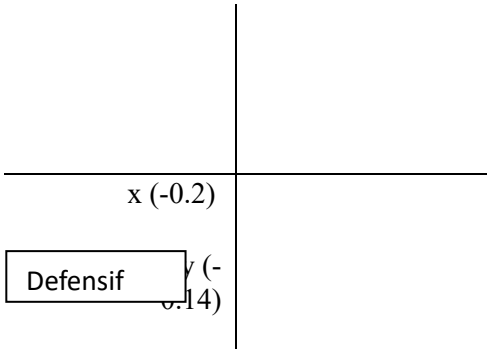
1. SO Strategy
   The SO strategy is an effort to increase productivity by leveraging strengths to exploit existing opportunities. The strategy used is to focus on Blocks BG 1, 2, 3, and 8 by mapping all heavy equipment with *water gate renovations,* adding roraks, and *molding processes* at several points in Blocks BG 1, 2, 3, and 8. The decline in these blocks can be seen in the following table.

Table 4. SO Strategy

Block	Decline
BG1	-3.63
BG2	-0.67
BG3	-1.49
BG8	-1.79

Thus, the highest decline is in block BG 1, so labor efforts will be deployed with a percentage at point BG 1. BG 1 is also affected by Ganoderma, so the *mounding process* needs to be carried out in that block. BG 1 is close to BG 8 and BG 3, so the *mounding process* can be easily directed to those areas. *Water gate renovations* begin in areas BG 2 and BG 8 so that mechanical maintenance will be carried out more efficiently. These improvements will improve soil conditions and minimize unharvested fruit.

2. ST Strategy
   The ST strategy is to use the strength of the plantation to avoid threats or overcome existing threats, where the strategy that will be used is to make a large ditch on the boundary of the block that borders the village, namely blocks BG 1, 2, 4, 7 and 8. Where at several points the block borders directly with the village and community plantations.
3. WO Strategy
   The WO strategy involves minimizing weaknesses by capitalizing on the opportunities the plantation offers. A suitable strategy is to collaborate with local residents by providing contract weed control, particularly in areas bordering the village, namely Blocks BG 1, 2, 4, 5, 7, and 8.
4. WT Strategy
   The WT strategy minimizes weaknesses by addressing existing threats. The strategy employed is to direct the community to focus more on the *replanting area* , building communication with the community and encouraging them to participate in monitoring the tender process to prevent damage to facilities and infrastructure. This way, the community will act as a watchdog for the tender. The block closest to the area is Block BG 6, which will ensure a more vibrant and attentive environment.
   Furthermore, based on the SWOT quadrant matrix, the strategy obtained is in Figure 1.



Based on the SWOT quadrant strategy, the appropriate strategy is the defensive strategy in Quadrant IV, which involves avoiding threats and addressing existing weaknesses. Therefore, the strategy to be implemented is to avoid problems arising from the community by involving them as contract workers and focusing on minimizing weaknesses by maintaining the current SPH. Because with the current SPH, improvements can be made. Based on this description, the increase in production can be seen in Table 5.

Table 5. Strategy for Increasing Bagerpang Plantation Productivity

Block	Actual Production 2025 (tons/ha)	Site Yield Potential 2026 (ton/ha)	Maximum Production Increase in 2026 (tons/ha)	Strategy Matrix	SWOT Quadrant Matrix
BG1	12.75	16.17	3.42	SO, ST, WO	Defensive
BG2	12.58	15.95	3.37	SO, ST, WO	Defensive
BG3	16.79	20.43	3.64	SO	Defensive
BG4	14.86	18.13	3.27	ST, WO	Defensive
BG5	15.91	15.91	(0.00)	WO	Defensive
BG6	13.89	21.19	7.30	WT	Defensive
BG7	16.78	20.68	3.90	ST, WO	Defensive
BG8	16.38	20.58	4.20	SO, ST, WO	Defensive
Average	14.99	20.58	4.20		

Based on Table 5 , the achievable production increase in 2026 is 4.20 tons/ha. This production is achieved using *the site yield potential reference* in 2026. The strategy used is a matrix strategy available in each block and an overall defensive strategy. The plantation strives to maintain SPH so that it does not further decline by *mounding.* Maintaining the number of bunches per tree to achieve maximum potential by creating rorak, avoiding conflict with the community by involving the community as maintenance contractors and digging large trenches in blocks bordering the community .

DISCUSSION

The results of the internal factor analysis indicate that rorak and *mounding construction* are the main strengths with a score of 0.84, followed by the availability of heavy equipment (0.48) and accurate crop administration (0.23). These results indicate that plantation productivity is largely supported by the application of cultivation techniques and soil and water conservation. According to Ir. Iman Pahan (2021), water management, soil conservation, and mechanization are important factors in maintaining oil palm productivity, especially for mature plants. This finding aligns with research by Carlina Falmawati Monita and Damara Dinda Nirmalasari Zebua (2023), which states that cultivation management, plant size, labor, and rainfall influence oil palm productivity.

Conversely, the weaknesses were dominated by low Stand Per Hectare (SPH) with a score of 0.49, followed by minimal technical supervision (0.39) and inadequate *water gate conditions (0.34). Low SPH indicates a reduced population of productive plants, thus preventing production per hectare from reaching its maximum potential. Furthermore, limited supervision during replanting activities* and suboptimal water management also impacted plant productivity. This condition aligns with Pahan's (2021) theory, which states that oil palm productivity is influenced by plant population, maintenance, and water management systems. Research by Monita and Zebua (2023) also demonstrated that plant number and rainfall significantly influence oil palm productivity.

Among external factors, the availability of labor from the surrounding community received the highest opportunity score of 0.90, while the area's proximity to the river received a score of 0.49. These conditions indicate that the company has the opportunity to improve the efficiency of maintenance activities by utilizing local labor and optimizing water resources. According to Helviani (2021), involving the surrounding community in operational activities can increase work effectiveness while strengthening the relationship between the company and the community. This finding is supported by research by PL Lumbanraja et al. (2023), which states that optimal utilization of human resources and management of production factors contribute to increased productivity of oil palm plantations.

Based on the SWOT matrix, PT PP London Sumatera Bagerpang Estate is in Quadrant IV (defensive strategy) with coordinates X = -0.20 and Y = -0.14. This position indicates that the company needs to minimize internal weaknesses while reducing the impact of external threats. The implementation of this strategy is projected to be able to increase average productivity from 14.99 tons/ha to 20.58 tons/ha, or an increase of around 4.20 tons/ha in 2026. This strategy focuses on SPH maintenance, *water gate repair* , rorak and *mounding construction* , and community involvement in garden maintenance activities. According to Freddy Rangkuti (2015), a defensive strategy is implemented to reduce internal weaknesses so that the organization is able to maintain performance and face threats from the external environment.

CONCLUSION

Based on the research results, the actual productivity of oil palm plants at PT PP London Sumatera Bagerpang Estate in 2025 decreased by 2.02 tons/ha . This decrease was mainly caused by low Stand Per Hectare (SPH) due to plant death caused by *Ganoderma attacks* and the low number of bunches per tree due to waterlogging that occurred in several blocks in the previous period. Based on the results of the SWOT analysis, the recommended strategy to increase productivity is to maintain SPH through *mounding activities* , building rorak, and optimizing mechanical plant care to increase the number of bunches according to production potential.

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