Increasing Company Productivity by Using the Green Productivity Method at PT. Mitra Agung Sawita Sejati

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	ABSTRACT
	The concept of All-Gender Facilities has caused controversy in many countries, especially regarding the experience of users who feel uncomfortable with the presence of other genders in private spaces such as toilets and changing rooms. This study aims to explore the acceptance of the community in the Greater Jakarta area towards the All Gender Facility, especially in the use of toilets and changing rooms. A qualitative approach with a case study method is used to understand and analyze the response of society influenced by social and cultural norms. Data was collected through in-depth interviews with eight purposively selected informants. The results of the study show that awareness and first experience in using the All Gender Facility are influenced by the level of social media exposure and personal experience when using it. Security and hygiene factors, including space design and management, are the main elements that affect user privacy and comfort. Consideration of cultural norms in the implementation of the All Gender Facility has a very important role in community acceptance. The multicultural community of Greater Jakarta shows resistance to this concept due to cultural and religious considerations. However, in terms of functionality, this concept is acceptable on the condition of a design that pays attention to user privacy and security.

Introduction

Pabrik Kelapa Sawit PT. Mitra Agung Sawita Sejati (PT. MASS) is one of the leading companies in the PKS industry sector. (Hage & Damayanti, 2020). This business is located in Bandar Tinggi Village, Bandar Masilam District, Simalungun Province. The company's products include crude palm oil (CPO) and palm kernel. The production process at the Palm Oil Mill (PKS) is rather long and requires careful attention to detail. It begins with the mixing of raw materials to produce Crude Palm Oil and Palm Kernel whose raw materials come from Fresh Fruit Bunches (FFB) of palm oil. (Sentoso & Nugroho, 2022).

PT. Mitra Agung Sawita Sejati (PT. MASS) is one of the few companies that produce crude palm oil which has a high enough potential for waste pollution so that it needs to be improved in its production process, both in terms of increasing productivity and more importantly, improving the quality of waste produced and increasing

environmental results from the production process (Maryani & Gazali, 2024). Therefore, two reasons are actively being sought to be solved, namely, economic reasons and environmental reasons are actively being sought to be resolved (Yandi & Havidz, 2022).

In addition to efforts to increase productivity, some challenges are detrimental to the surrounding environment. The cause of this problem is a production process that is too slow so it has an impact on the production of materials and energy that will damage the environment. (Pratama, 2023). However, a successful production process not only looks at how to produce the final product but also considers an equally important but still important aspect, namely the preservation of process samples. For this reason, business actors need to conduct productivity audits to find out the productivity thresholds that have been achieved and produce environmentally friendly products. (Maciel & Freitas, 2019).

Based on the findings of the previous survey, it was found that the solid waste produced has not been treated, thus increasing the possibility of environmental pollution. Both productivity and environmental quality will decrease as a result. So that an alternative solution to the untreated solid waste is carried out. An alternative solution taken is to build the processing of PKS waste into compost. (Sari et al., 2022).

The purpose of this study is to identify factors that affect productivity levels, measure environmental performance through the application of Environmental Performance Indicators (EPI), and find alternative solutions for improvement with the Green Productivity (GP) approach.

Method

This research includes applied research (Applied Research) which aims to find solutions to certain problems. Applied research produces a research result that is directed to take action in changing the state of competition and solving real problems. The results of applied research should not be defended in front of experts or archived in libraries, instead, they must be tested in the real world with implementations that can handle existing challenges (Sinulingga, 2012).

The first step in implementing this research is to identify the issues to be discussed and the goals to be achieved. A literature review of theories related to productivity, GP, and environmental performance was conducted to assist in the implementation of the research. Field surveys are used to conduct field studies and collect data on solid waste treatment as part of the first phase of GP implementation.

The research was conducted in 2024. The research was conducted at PT. Mitra Agung Sawita Sejati is located in Bandar Tinggi Village, Bandar Masilam District, Simalungun Regency.

Research Stages

This research stage starts by identifying problems that occur in the company's waste, which can be seen in the following Figure 1:
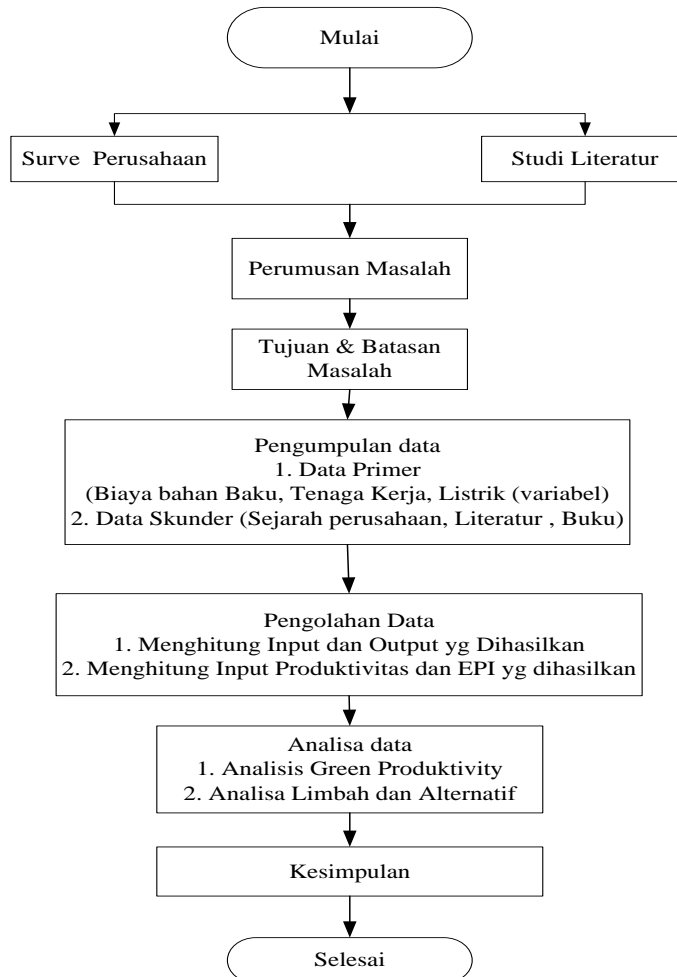
Figure 1
Research Flowchart

Results and Discussion

Productivity is obtained by comparing the output with the total input. To calculate the total productivity, it is seen that the total productivity of MSMEs PT. Mitra Agung Sawita Sejati has improved overall. The level of productivity is very large and influenced by the procurement of raw materials, namely oil palm fruit bunches are not counted because the raw materials come from the MSME plantations of PT. Mitra Agung Sawita Sejati itself.

Based on observations and interviews obtained, the handling of waste can be described as follows:

1. To control gas waste, the "Duat Coller" tool is used which functions to capture/filter ash and small particles carried by smoke before coming out of the smoke hopper, so that it does not cause environmental pollution.
2. Currently, empty bunches of oil palm are handled by spreading them on oil palm plantations as mulch. In addition to the high cost, this method also has several disadvantages, such as:
   a. Cutting down empty bunches under oil palm trees will invite insects that then land on oil palm trees and become pests for oil palm.
   b. 0.3% of the empty bunches given to plantations still have loose fruit bunches. The remaining loose fruit bunches will attract rat pests to the empty bunch pile, which causes the rats to start uprooting oil palm plants and reducing their yields.
   c. The unpleasant smell that arises from the accumulation of empty bunches in oil palm plantations disturbs residents.
3. The handling carried out on liquid waste is by carrying out treatment and by land application treatment. After the threshold set for this waste is reached, this waste will be returned to nature, namely by flowing to plantation land

The goals and targets to be achieved are to reduce the impact of waste on the environment by generating alternatives that can use all industrial waste to a result that is beneficial to the environment and useful for increasing the company's productivity.

Green Productivity Analysis

Productivity can show how well procedures have been followed to increase output as well as how well inputs can be conserved. To determine the number of inputs and outputs produced, costs are considered. (Arda, 2017). In this case, inputs are determined by the cost of materials, labor, energy, and other production-related costs, while output is the final product of production. Input and output data of the production process for the productivity of MSMEs PT. Mitra Agung Sawita Sejati which was measured from August 2022 to July 2023. are as follows (Sirait, 2020)Analisa Produktivitas pada UKM Dompet Kulit dengan Metode Objective Matriks (OMAX)Analisa Produktivitas pada UKM Dompet Kulit dengan Metode Objective Matriks (OMAX).

Data Processing

The data processing used to solve the problem studied will be described in the following sections. Data processing includes calculating the EPI index, identifying the causes of problems, setting goals and targets, compiling and selecting alternative solutions that are anticipated to have a lower environmental impact, and calculating productivity to assess the level of productivity in the company.

Productivity Calculation

Comparing total output and total input results in productivity. The overall productivity level of the organization from August 2022 to July 2023. Green Productivity focuses on analyzing and re-evaluating production processes to identify the best ways to increase output while reducing environmental impact. The application of this research results in a continuous review and improvement process, which is generally referred to as continuous improvement. (Avianda et al., 2013).

In the implementation of Green Productivity, there is a Green Productivity Indicator (GPI), which is an evaluation of environmental performance and is also a step towards a stronger and more quantitative approach to making environmental decisions. GPI is defined as the ratio of productivity in a system divided by environmental impact.

$$GPI = Productivity/Environmental\ impact$$

Green Productivity can be calculated by dividing the initial condition GPI by the alternative solution GPI. A larger number in the calculation results indicates that the alternative solution performs better. The study input data, which includes labor costs, energy costs (coal and electricity), supporting raw materials, and primary raw materials, is used to calculate productivity levels. The following is a calculation of total productivity based on output data and input data:

1. $Productivity = \dfrac{Output}{Input} = \dfrac{20{,}385{,}000{,}000}{4{,}435{,}535{,}000} = 4.59584 = 459.58\%$

2. $Productivity = \dfrac{Output}{Input} = \dfrac{19{,}850{,}000{,}000}{4{,}591{,}785{,}000} = 4.32294 = 432.29\%$

3. $Productivity = \dfrac{Output}{Input} = \dfrac{20{,}525{,}000{,}000}{4{,}937{,}635{,}000} = 4.15685 = 415.68\%$

4. $Productivity = \dfrac{Output}{Input} = \dfrac{21{,}350{,}000{,}000}{5{,}063{,}825{,}000} = 4.21618 = 421.61\%$

5. $Productivity = \dfrac{Output}{Input} = \dfrac{20.320.000{,}000}{4{,}732{,}412{,}500} = 4.29379 = 429.88\%$

6. $Productivity = \dfrac{Output}{Input} = \dfrac{20{,}500{,}000{,}000}{4{,}724{,}145{,}000} = 4.33941 = 433.94\%$

So the results of the calculation of Green Productivity during the period from August 2022 to July 2023 are as shown in the table below:

Table 1
Productivity Calculation Data

Moon	Year	Output	Input	Productivity
August	2022	IDR 20,385,000,000	IDR 4,435,535,000	459.58 %
September	2022	IDR 19,850,000,000	IDR 4,591,785,000	432.29 %
October	2022	IDR 20,525,000,000	IDR 4,937,635,000	415.68 %

Month	Year			
November	2022	IDR 21,350,000,000	IDR 5,063,825,000	421.62 %
December	2022	IDR 20,320,000,000	IDR 4,732,412,500	429.38 %
January	2023	IDR 20,500,000,000	IDR 4,724,145,000	433.94 %
February	2023	IDR 21,050,000,000	IDR 4,706,560,000	447.25 %
March	2023	IDR 22,368,000,000	IDR 4,717,665,000	474.13 %
April	2023	IDR 22,545,000,000	IDR 5,225,005,000	431.48 %
May	2023	IDR 20,856,000,000	IDR 4,994,387,500	417.59 %
June	2023	IDR 21,025,000,000	IDR 5,318,980,000	395.28 %
July	2023	IDR 21,725,000,000	IDR 5,407,600,000	401.75 %

Based on the data from the productivity table above, it shows that the company's productivity level for the period August 2022 – June 2022 is quite stable because it is at 395.28% - 474.13% and produces an average value of 430.00%. This figure shows that productivity is stable and of course, can be increased again so that the company gets greater profits. Here is a graph showing the productivity index for 12 months. Figure 1 is a graph that illustrates the company's productivity growth rate which shows that the company's productivity is stable.

EPI Index Calculation

The value of the EPI index can be determined by the following formula:

$$Indeks\ EPI = \sum_{i=1}^{k} Wi.Pi$$

Information:
K= Criteria
Wi: Weight of each (k)
Pi: Percentage of Deviation

Where k is the number of waste criteria submitted and Wi is the weight of each criterion. The results of the calculation of the EPI index can be seen in the following table:

Table 2
Calculation of EPI Index of Human Health Parameters

Variable	Weight (Wi)	Waste Standard	Results of Analysis	Deviation (PI)	EPI Index
Cadmium (Cd)	8,8	1,0	0,031	0,9690	8,5272

Chromium (Cr)	8,6	5,0	0,015	0,9970	8,5742
Copper (Cu)	6,6	10,0	0,033	0,9967	6,5782
Mercury (Hg)	9,8	0,2	0,0001	1,0000	9,7995
Selenium (Se)	7,4	1,0	0,011	0,9890	7,3186
Zinc (Zn)	7,2	50,0	0,015	0,9997	7,1978
Total EPI Index					47,9955

The value of EPI Indexes from waste treatment at PT Mitra Agung Sawita Sejati is 47.9955. The indexes indicate that the company in question is performing well in the environment. The results of Pi are said to be good if the percentage is positive and the value is getting bigger.

Alternative Repair Solutions

To achieve the goal of increasing the desired productivity by reducing waste levels and processing it. So there must be an alternative solution that can carry out the process and succeed properly.

Benefit-cost ratio analysis is a tool used to make public decisions by considering the welfare of the community. This benefit-cost ratio analysis only focuses on the efficiency of the use of production factors without considering other problems such as distribution, economic stabilization, and so on. This analysis only determines the program in terms of efficiency while the selection of program implementation is in the hands of the executive power holder who also considers other factors in choosing.

In the proposed alternative solution, namely the composting of palm oil processing waste, the following amounts of benefits and costs are obtained:

Benefit = Receipt (P/A.i%.n)

   = (Cost savings for spreading empty bunches + Cost savings on treatment and operation of liquid waste + Fertilizer substitution) x (P/A.11%.2)

   = (IDR 12,624,950,000 + IDR 6,000,000,000 + IDR 58,074,770,000,000) x (1,713)

   = IDR 131,386,620,360

Cost = Initial investment + Operating cost (P/A.i%.n)

   =Rp.25,249,900,000 +Rp.3,460,000,000 (1,713)

   =IDR 49,180,058,700

BCR Index Alternative Solutions $= \dfrac{\text{Benefit}}{\text{Cost}}$

$$= \frac{131.386.620.360}{49.180.058.700}$$
$$= 2,671$$

Based on the results of the BCR index calculation, it can be seen that the alternative solution has a BCR index of 2.671 which means that it is much more profitable than the current conditions. Therefore, alternative solutions are applied to increase the productivity of palm oil processing and reduce the environmental impact on PT. Mitra Agung Sawita Sejati, namely by composting palm oil processing waste.

Green Productivity Index Calculation

In making decisions, the appropriate information to make decisions is based not only on economic productivity but also on environmental performance. Therefore, there is a need for GP indicators that include productivity and environmental elements at the same time. The productivity of PT. Mitra Agung Sawita Sejati for the period of August 2022 – June 2023 is 395.28% -474.13% and yields an average of 430.00%.

Conclusion

Based on the results of processing and analysis, it can be concluded that the factors that affect the company's productivity level are solid waste that has not been treated, especially empty bunches that can invite insects and rat pests, thereby reducing the productivity of oil palm plants and causing unpleasant odors that disturb the surrounding population. Environmental performance is measured using the Environmental Performance Indicator (EPI) in MSMEs of PT. Mitra Agung Sawita Sejati showed a value of 47.9955, which indicates that the company's environmental performance level is good. As an alternative solution to reduce the amount of waste, the processing of palm oil mill waste into compost is proposed, where the application of the Green Productivity method is proven to be able to increase productivity and environmental performance by reducing the chemical content in waste and supporting a more environmentally friendly production process.

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