PRODUCTION_MANAGEMENT_OF_CRUDE_PALM_OIL.pdf

by

Submission date: 26-Apr-2023 04:16PM (UTC+0700)
Submission ID: 2075979114
File name: PRODUCTION_MANAGEMENT_OF_CRUDE_PALM_OIL.pdf (275.14K)
Word count: 5932
Character count: 31244

PRODUCTION MANAGEMENT OF CRUDE PALM OIL (CASE STUDY AT "X" COMPANY)

Manajemen Produksi *Crude Palm Oil* (Studi Kasus pada PT. "X")

Baharuddin[1*], Kadek Rantawan[2], Andi Tenri Fitriyah[3], Ratri Retno Utami[4], Nurhayati[5], Mulono Apriyanto[6]

[1,2,3]Faculty of Agriculture, Universitas Bosowa

[4]Department of Rubber and Plastic Processing Technology, Politeknik Akademi Teknologi Kulit

[5]Faculty of Agriculture, Universitas Muhamadiyah Mataram

[6]Faculty of Agriculture, Universitas Islam Indragiri

email: *baharuddin@universitasbosowa.ac.id

Abstrak: *Faktor yang memengaruhi produksi Crude Palm Oil (CPO) adalah peningkatan konsumsi CPO, dengan penerapan manajemen proses produksi CPO maka dapat memenuhi permintaan domestik dan ekspor. Tujuan dari penelitian ini adalah untuk mengetahui penerapan manajemen proses produksi CPO di PT. "X". Penelitian ini dilaksanakan pada bulan Mei sampai dengan Juni 2018. Teknik pengumpulan data menggunakan teknik purposive sampling dengan analisis deskriptif. Hasil yang diperoleh menunjukkan bahwa berdasarkan penerapan manajemen produksi, masih diperlukan perbaikan melalui peningkatan produksi CPO dengan meningkatkan kapasitas mesin produksi dari 2,5 ton/lori menjadi 10 ton/lori. Selain itu juga diperlukan peningkatan kualitas SDM dan produk untuk meningkatkan daya saing perusahaan.*

Kata kunci*: manajemen, produksi, permintaan, CPO, perencanaan*

Abstract*: Factors that influence Crude Palm Oil (CPO) production is the increase in CPO consumption and with the implementation of CPO production process management, it can meet domestic and export demand. The purpose of this study was to determine the application of CPO production process management at "X" Co. This research has been conducted from May to June 2018. The data collection technique was purposive sampling with descriptive analysis. The results obtained indicate that based on the implementation of production management, improvements are still needed through increasing CPO production by increasing the capacity of production machines from 2.5 tons per lorry to 10 tons per lorry. In addition, it is also necessary to improve the quality of human resources and products to increase the company's competitiveness.*

Keywords*: management, production, demand, CPO, planning.*

INTRODUCTION

The agricultural sub-sector, which is currently increasing is the plantation sub-sector. Plantation commodities are a trigger for national economic development that contributes as a source of foreign exchange, consumption needs, sources of industrial raw materials, providers of job opportunities, and sources of income (Majidah et al., 2021). Management of plantation economic resources is expected to supply quality raw materials and process them into high value-added products (Kemenkeu, 2012). The increase of palm oil production in Indonesia in line with the increasing needs of the consumer. The development of the palm oil industry is growing quite rapidly, which is indicated by the increase in area and production. In 2018 the area of oil palm plantations was 14,326,350 hectares and reached 14,724,420 hectares in 2019. Most of this area is managed by the private sector covering an area of 8,061,636 hectares, the government covering an area of 627,042 hectares, and smallholders covering an area of 6,035,742 hectares (Ditjenbun, 2019).

The development of palm oil production in the form of CPO in Indonesia since 1980 has continued to increase with an average of 11.48% per year (Ditjenbun, 2019). CPO is the raw material for palm cooking oil, in 2019 palm oil production was 51.8 million tons consisting of 47.2 million tons of CPO and 4.6 million tons of Crude Palm Kernel Oil (CPKO). CPO exports from this production are around 7 million tons and 40 million tons are processed for domestic needs as cooking oil, bioenergy, and others (Utami and Amalia, 2019). Palm cooking oil production in 2019 was around 18 million tons, of which 6 million tons were to meet

domestic needs and 12 million tons were exported (Anonymous, 2020).

Cooking oil derived from palm oil plays a dominant role when compared to cooking oil derived from other vegetable oils. Data from the Global Agricultural Information Network shows that CPO consumption reached a maximum of 13,110 thousand metric tons in 2019. This number is greater than the consumption of other types of vegetable oils such as coconut oil, peanut oil, copra seed oil, and soybean oil. Meanwhile, the second-largest consumption is CPKO, which is 3,100 thousand metric tons in the same year. The trend of palm oil consumption also shows an increase compared to the previous year which reached 12,050 thousand metric tons in 2018 and 11,000 thousand metric tons in 2017 (Katadata, 2020). World consumption of CPO from year to year continues to show an increasing trend. The growth in world CPO demand in the last 5 (five) years, grew by an average of 9.92%. China and Indonesia are the countries that utilize the most CPO in the world. The growth of Indonesian cooking oil consumption per capita is also quite high, in 1996 it was 9.6 kg/capita increased to 12.8 kg/capita in 2002 or grew by an average of 11.7% per year, and in 2019 to 12.06 kg/capita/year (BPS, 2019). Indonesia's global CPO trade also shows an increase. Exports in 2018 amounted to 27,898,875 tons and increased to 28,279,350 tons in 2019 (Ditjenbun, 2020). It is predicted that this increase in consumption and exports will continue even in a larger percentage considering the factors that support this are quite a lot, such as population growth, downstream industry growth, development of alternative energy. Malaysia and Indonesia are predicted to continue to be major players in this CPO export, considering that there has been no significant development from other competing countries (Putri, 2017).

Process engineering capabilities of palm oil industries in Indonesia mostly produce CPO and CPKO. Processed palm oil is mostly used as a product for food needs such as cooking oil, for non-food products it is still limited (Pratama, 2018). Palm Oil Mill (POM) technology is increasingly developing and innovative, all aiming to produce high-quality palm oil output. The processing carried out by POM is basically very simple, namely the process of squeezing the oil in the fresh fruit bunches of oil palm. In principle, palm oil processing is a mechanical extraction of CPO from Fresh Fruit Bunches (FFB) followed by a purification process. Overall, the process consists of several stages that run continuously and are interconnected (Mardhiah, 2013). However, the implementation of palm oil processing requires long stages and needs to be supported by good production management. Production management is the process of planning, organizing, implementing, and supervising the efforts of organizational members and the use of other organizational resources in order to achieve predetermined organizational goals. Production management is a management process that is applied in production activities or fields within a company (Hermani and Prabawani, 2007).

The palm oil commodity continues to grow in West Sulawesi Province, in 2019, palm oil production reached 258,755 tons (BPS, 2020). As one of the companies in West Sulawesi engaged in the oil palm plantation business, “X” Co. also continues to improve its industrial performance. The “X” Co. was established in 1985 and is located in Pasangkayu Regency, West Sulawesi Province. “X” Co. also implements production management to increase its production. Factors that affect the production of CPO, especially at “X” Co. is CPO consumption. The application of management of the palm oil production process can meet domestic and export demand. The purpose of this study was to determine the application of palm oil production process management at “X” Co. While the benefits of this research are as material for consideration for the company in policies, especially in the field of CPO and kernel production as well as material for the development of science for further research.

METHOD

This research has been carried out at "X" Co., North Mamuju Regency, West Sulawesi Province. This research took place from May to June 2018.

Respondent Determination Technique

Determination of respondents was carried out by purposive sampling in several parts of the company with the consideration that the selected respondents could provide accurate information, especially regarding the implementation of CPO production management functions at "X" Co. The number of respondents selected was 15 people, namely one Assistant Head, one Production Assistant, one Laboratory Assistant, one Section Head, six Foreman, and five Employees related to the palm oil production process.

Data Sources and Analysis

The data needed in the research carried out are primary data and secondary data. Primary data is data collected directly with respondents, while secondary data is data obtained from companies in the form of reports and documents. This data includes a brief history of the company, organizational structure, and resources owned by the company. The data obtained during the research, both primary and secondary, were analyzed descriptively, namely explaining in detail the application of management functions in the production process.

Operational Definition

To facilitate and assist the implementation of this research, it is necessary to put forward the following definitions:

- Management is a process of planning, organizing, directing, and supervising as well as the use of all existing resources in the organization of "X" Co. to achieve predetermined organizational goals.
- Production management is management applied in the field of production at "X" Co. includes the provision of raw materials and production processes.
- FFB is fresh fruit bunches that will be processed into palm oil produced by companies and farmers.
- POM is a mill that functions to process palm oil into CPO and kernels.
- The production process is an activity carried out by "X" Co. to produce products in the form of palm oil and kernels.
- CPO is palm oil obtained by extracting the flesh of the fruit of the palm oil.
- Palm oil is edible vegetable oil, which is produced from the mesocarp (fruit fiber that contains a lot of oil) in the oil palm fruit.
- Kernel or palm kernel obtained from breaking the shell of oil palm.

RESULT AND DISCUSSION

Management Functions in Production

Planning function.

The first task before carrying out the production of a product is making a plan to realize the goals set. Planning activities at "X" Co. covers raw material and product planning.

a. Raw Material Planning

The raw materials to be processed by "X" Co. is oil palm FFB obtained from the core estate owned by "X" Co. In addition, it also buys from plasma farmers and partners who are close to the POM area which has certain varieties and meets the criteria for ready-to-process oil palm fruit. The volume of raw materials to be processed per day is 30 tons from the previous processing capacity of 60 tons per day. The decrease in process capacity is because some of the existing equipment is currently being added to their capacity from one lorry with a capacity of 2.5 tons to 10 tons per lorry. To meet the daily needs of raw materials, the company divides the harvest schedule for each farmer group and the company's nucleus plantations so that every day the company can process raw materials as needed, which is 30 tons per day.

The harvest schedule that has been set can be changed if the harvest time coincides with a holiday. The harvest schedule starts from Sunday to Friday. Harvesting is not carried out on Saturdays because the company does not produce on Sundays. The transportation will be carried out after all group members have finished harvesting and the total number of harvested bunches has been recorded by the farmer group management. After that, the FFB is transported to the company. There are two factories located in Baras District and each factory receives fresh fruit bunches from five residential units, both plasma fruit, partners, and the company's core plantation area. Mature fresh fruit bunches have certain characteristics such as starting to change the color of the fruit and already having fruit seeds that are released from the bunch. The mature criteria set by the company can be seen in Table 1.

Table 1. Criteria for Mature Harvest of Oil Palm Fruit

Harvest Fraction	Degree of Maturity	The Number of Lumps on The Plate (pcs)
00	Very Raw	0
0	Raw	0
1	Mature I	1-10
2	Mature II	10-25
3	Overripe	>25
4	Too Ripe	Empty palm

Source: Sorting section “X” Co.

Based on Table 1, show that the degree of maturity is very unripe with the characteristic that it is still black, the flesh is still white, which means that it does not have oil content in the flesh. Fruit harvesting at this stage will not obtain palm oil because the water content in the fruit is still too high without any oil. The degree of raw maturity with the characteristics of the fruit has started to change color to a slightly red color and the flesh of the fruit has begun to turn pale yellow with very little oil content and water content is still more than needed to make oil so at this level it will not be accepted for processing into the next step.

Mature degree I with the characteristics of the fruit being shiny red and the flesh of the fruit is already orange, marked by the start of loose bunches that have been separated from the fruit bunches. At this level, the bunches are very good for harvesting because the oil content in the fruit flesh is already higher than the water content. So that good harvesting is done at this level of maturity. Mature degree II shows characteristic red fruit and dark orange flesh. This level of maturity is marked by a large number of fruit that is released from the bunch, ranging from 10-25 grains. At this maturity, produce the higher oil content, because decreasing the water content in the flesh. Harvest time should be done at this stage.

The degree of overripe is indicated by the large amount of loose fruit that is released from the bunch, the oil content begins to decrease and the dirt content begins to increase. Dirt increasing due to the rotting of the flesh of the fruit. At this level, it is not recommended to be harvested and processed but at this stage, the bunches must be harvested because if the bunches remain on the tree, it will indirectly damage the tree trunks and still take the nutrients that should be for other bunches. The degree of too ripe is indicated by at least the rest of the fruit or empty bunches. At this level, there is no more oil content, but the level of dirt is too high, this is due to the rotting of the whole fruit flesh. At this stage, the bunches must be harvested immediately to avoid stem damage and the development of pests that can damage immature fruit. The amount of raw materials planned to be processed can be seen in Table 2.

Table 2. Amount of Raw Material Processed in 2015-2017

Years	Plan (Ton)	Process (Ton)
2015	40,380,563	37,582,090
2016	44,369,620	45,766,530
2017	49,486,359	52,906,260

Source: Sorting section "X" Co.

b. Product Planning

Product planning carried out is product quality planning to produce CPO and kernels based on predetermined quality standards. Quality requirements are measured based on international quality standard specifications which include levels of Free Fatty Acids (FFA), moisture content, impurities, ferrous metals, copper metals, peroxides, and bleaching measures. Oil quality standard produced by "X" Co. include FFA <3.50%; moisture content <0.15%; impurities/dirt <0.020%; and deterioration of bleachability index >2.50. The low quality of palm oil is determined by many factors, including the nature of the parent, harvesting, post-harvest handling, or errors during transportation to the processing stage. As for the analysis of quality and losses in palm oil, it is carried out starting from several sample points during production starting from the loading ramp, sterilizer, pressing station, clarification station, kernel recovery, and storage tank.

Production Organization Function

Production organization is an effort to compile job descriptions with the division of tasks and respective authorities to realize work plans in production activities. With the existence of a production organization, every employee can know the tasks or work that must be carried out (Murti, 2015). The workforce involved in the production process at "X" Co. as many as 149 employees, each employee has a clear division of tasks for each production activity starting from the head of the production section, the raw material section, processing supervision, and employees who will carry out work such as the weighing section, sorting to the processing section.

Directing Function

Directing is providing guidance, advice, and orders to subordinates in carrying out their respective duties so that they can run well and the goals that have been set can be achieved (Dunie, 2018). Directing was made to all employees of "X" Co. is conducted 2 times a week, on Mondays and Saturdays. This directing aims to guide employees so that they can carry out their responsibilities towards their work.

Control/Supervision Function

The monitoring is carried out on all activities made by employees. Supervision duty is to supervise employees in carrying out the tasks that have been assigned to them so that if there are problems, control and corrective action can be taken. The implementation of supervision makes employees work more carefully and directed which will affect obtain the result. Supervision carried out at "X" Co. includes supervision during the processing, sorting, storage, and maintenance of equipment. Supervision is carried out at the time of sorting so that the sorting products are by the plan, namely to produce quality CPO. Supervision on weighing is carried out so that employees who weigh carefully match the scales between the weight of FFB and CPO, both when weighing raw materials and after processing. Equipment supervision is carried out before and after the production process. Before the production process begins, all equipment used must be available and still functioning properly. After the activity is complete, the equipment must be cleaned from the dirt.

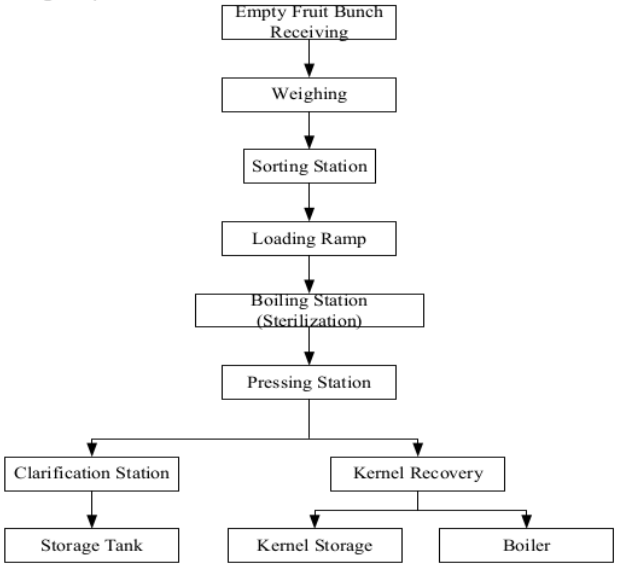
Evaluation/Assessment

Evaluation is an activity carried out to find out the results of the implementation of production activities, whether it is appropriate or not as planned. The assessment is carried out by comparing the results achieved with the standards set at the time of planning (Hidayah, 2017). Assessment or evaluation conducted at "X" Co., namely the production quality CPO according to standards. This assessment was carried out by the Mill

Manager with the result that the company was able to produce CPO with international quality standards.

Application of Management in Palm Oil Production Process

The application of management in the palm oil production process is an arrangement through a process and based on stages to process FFB into CPO. The stages are starting with receiving FFB, weighing, sorting stations, loading ramps, sterilizing stations, pressing stations, clarification stations, storage tanks, kernel recovery, kernel storage, and boilers. The descriptions of these stages can be seen in Figure 1.



Source: Production "X" Co.

Figure 1. Production Process Chart

Discussion

The best standard for harvesting is Mature I and II because at this degree of maturity is obtained the highest oil yield, good oil quality, FFA content, and low water content (Nurhayati et al., 2021). Harvesting fruit that is too raw and overripe can affect the oil yield so that the water content, sludge, and FFA will increase which can cause a decrease in the quality of the oil and can cause losses to the company (Irianto and Apriyanto, 2012). Fresh fruit bunches that do not meet the requirements, will return to the farmer, and it also causes loss for farmers. If there are bunches that are returned, the fruit that is too ripe will be resold. Empty bunches are placed under oil palm trees as fertilizer, a fungus growing medium that can reduce weed growth.

The planned raw material processed in 2015 was 40,380,563 tons but the realization was 37,582,090 tons. This is due to the palm tree regeneration in plasma plantations. In 2016, the raw material plan amounted to 44,369,620 tons and realized 45,766,530 tons. This is because the core plantations have started to produce and the partner plantations have increased. In 2017, the raw material plan is 49,486,359 tons and the realization was 52,906,260 tons. This is due to plasma plantations that have been producing with good maintenance, weather, and climate that support an increase in the amount of production of raw materials.

One part of the production organization function is the production assistant. The production assistant is

assigned to supervise employee activities from raw material inventory, weighing, sorting, and processing. The purpose of organization function is so that employees can carry out tasks according to the type of work that has been assigned. The head of this production section makes a report that will be accounted for by the manager.

The directing function can be done suddenly by assistants in the production department before processing and sorting so that employees are more careful in choosing raw materials to be processed so that they can produce quality products. This is also done in the next production management function.

Fresh Fruit Bunches Receiving

The process of receiving fruit begins with weighing fresh fruit bunches from the plantation. The weighing of fresh fruit bunches is carried out at a weighbridge which functions to determine the number of fresh fruit bunches that enter the POM. Weighing makes it easy to determine the oil and core yields and the average bunch weight. The weight of fresh fruit bunches can be determined from the difference between the gross weight of the empty truck and when the truck is loaded with FFB. Before weighing the car plate number must be recorded. Before entering the car, the scale must be confirmed to the number 00. Checking the appropriateness of the weighing to prevent fraud is carried out by lowering the driver, assistant, and other items. Damage to the scales is prevented by keeping the truck clean.

Fresh Fruit Bunches Sorting Station

At this station, the quality of fresh fruit bunches was separated or grouped according to the fraction as one of the requirements for the quality of CPO. Sorting or grading aims to determine the quality of FFB entering the POM, to improve the quality of CPO. By improving the quality of oil yield in FFB, it can increase production yields. Fresh fruit bunches were brought by transport trucks to the grading station for further sorting of the bunches. The bunches that will be accepted are bunches that meet the company's requirements. If the fresh fruit bunches do not meet the requirements, the bunches will be returned to the farmer group.

Temporary Loading (Loading Ramp)

Fruit bunches that have gone through this grading process will then be loaded into the lorry. A lorry is a place to bring fresh fruit bunches to the sterilizer station and each lorry has a capacity of 2.5 tons. Fresh fruit bunches are loaded into the lorries by opening the hydraulic loading ramp door and using the First In First Out principle. The loading ramp building has a slope of 30° on the floor to facilitate the collection of fruit that has gone through the grading process. Fresh fruit bunches are poured into the bulkhead where each bulkhead will fill one lorry and the filling is arranged from one door to another, this aims to make it easier to fill the lorry. Filling the lorries should not be too full to prevent the fruit from falling before entering the boiling station. If this happens, it can result in inhibition of ongoing activities and can cause production losses.

Boiling Station (Sterilizer)

Boiling is one of the main stages in the processing of fresh fruit bunches. Good and bad quality and processed POM products are mainly determined by the success of the stew (Lubis, 2017). Boiling the fruit must be following the provisions and is an absolute processing process. Boiling or fruit sterilizer is carried out in a sterilizer which is a pressurized steam vessel. The sterilizer used can load 10 lorries with a steam pressure of 3 kg/cm^2. The lorry where the fruit is made has a hole with a diameter of 0.5 inches, which serves to drip condensate water between the fruit.

Pressing Station

At this station, several tools function to process boiled palm oil so that oil and kernels can be obtained. A fruit threshing machine is a machine that functions to separate loose fruit from oil palm bunches. The boiled fruit in the sterilizer is lifted with a hoisting crane and poured into the thresher through a hooper that serves to accommodate the boiled fruit. The separation of fruit and bunches is done by slamming fruit bunches in a rotary drum

with a rotation speed of 23-25 rpm. The separated fruit then falls through the grating and is accommodated by the fruit elevator and carried by the distributing conveyor to each digester unit.

The digester consists of a cylindrical tube that stands upright in which there are 6 levels of stirring blades attached to a shaft and driven by an electric motor. The fruit is stirred and crushed in the digester to separate the pulp from the seeds. To facilitate the pulverizing process, 90-95 °C heat is needed which is given by injecting 3 kg/cm^2 steam. The stirring or pulverizing process lasts for 30 minutes then the fruit is put into a screw press. Pressing serves to separate the CPO from the nut and fruit flesh (pericarp). The mass removed from the digester is processed in a screw press at a pressure of 50-60 bar using rinse water at a temperature of 90-95 °C. Pressing produces crude oil, pulp, and seeds. The seeds mixed with the fiber enter the case breaker conveyor to chop the lumps of seeds and fibers, while the crude oil is accommodated on the vibrating screw. Crude oil is added with water to separate the sludge and then flowed to the clarification station (purification).

Oil Clarification/Purification Station

Crude oil from the pressing station is sent to this station for further processing so that crude oil is produced. The process of separating oil, water, and dirt is carried out by a precipitation and evaporation system. To precipitate insoluble particles or those that can still escape from the vibrating screw, a crude oil tank machine is used. The separation of water, sludge, and oil then use a clarifier settling tank. Then the water content of the oil was reduced using a vacuum dryer. After that, the oil is temporarily stored in the oil tank. Sludge that still contains oil is brought into the sludge tank which is then reprocessed using a centrifuge to extract the oil. The obtained oil is then flowed into a vacuum drier to reduce its water content. Furthermore, the oil is stored in the oil tank. Sludge that no longer contains oil is channeled to a sewage treatment pond and can then be used as liquid fertilizer in the company's plantation (Melisa and Apriyanto, 2020).

Storage Tanks

The oil from the oil tank then flowed to the storage tank which functions as temporary storage. Storage aims to maintain the quality of CPO and avoid contamination of water and dirt. The storage tank capacity is 2,000 tons/tank and oil production reaches 15 tons/day. The length of time or length of storage of CPO in storage tanks is influenced by the arrival of transport vessels. If the ship is delayed, production will be reduced until the ship arrives at the dock to transport CPO to the head office.

Kernel Recovery

At the kernel recovery station, the nut, fiber, and solid fraction of pressing will be separated. The rest of the pressing goes to the polishing drum which serves to separate the stalks, fiber, gravel, and nuts. The kernel is obtained from the nut that has been cleaned of fiber, the nut is accommodated in a silo and then broken using a ripple mill machine to produce a kernel. Before the kernel is stored, the moisture content must be reduced using a kernel tray dryer. Furthermore, the fiber is used for the boiler section as fuel to operate all machines. The fiber in the form of fine fibers, flammable and comes from the rest of the fruit flesh that does not contain oil.

Kernel Storage

The function of kernel storage is as a place to store palm kernels before shipping them to the market. Kernel storage is guarded by several people whose job is to collect kernels that fall from the kernel tray dryer using sacks. Each sack can accommodate ±50 kg kernels with a storage capacity of 1,500 tons.

Boilers

In this section, there is a water pump machine that functions to drain water to the sterilizer which will be used for boiling and uses fiber as the main fuel. In this section, there are also generators, turbines, lime chambers that function as the driving force for all machines in carrying out production.

CONCLUSION

Implementation of production management in "X" Co. includes Planning functions that manage raw material inventory and product planning; Organizing function which includes the preparation of job descriptions, division of tasks, and authority in production activities; Directing function begins with the process of weighing, sorting, processing, and storing; Supervision is carried out starting from weighing, sorting, processing, laboratory testing to storage; and Evaluation is done by assessing whether the product produced is following the standards that have been set.

Suggestions for improving the production management of "X" Co. to further increase CPO production by accelerating the repair process on the production machine from the original 2.5 ton per lorry capacity to 10 tons. Improving the quality of human resources and products needs to be done to increase the company's competitiveness in the face of increasingly broad market competition. Plasma farmers and partners are expected to always pay attention to the level of harvest maturity so that there is no return of bunches from the company.

REFERENCES

1. Anonymous. (2020). *Business matching untuk percepatan substitusi impor-sektor industri agro*. Kementerian Perindustrian Republik Indonesia. http://www.nanotechexpo.jp/icsbizmatch_nanotech.html
2. BPS. (2019). *Direktori perusahaan perkebunan kelapa sawit 2018*. Badan Pusat Statistik. https://www.bps.go.id/publication/2019/11/22/f9ad9da6bac600960802c85f/direktori-perusahaan-perkebunan-kelapa-sawit-indonesia-2018.html
3. BPS. (2020). *Provinsi Sulawesi Barat dalam angka 2020* (Issue 1). BPS Sulawesi Barat. https://doi.org/10.16309/j.cnki.issn.1007-1776.2003.03.004
4. Ditjenbun. (2019). Statistik perkebunan Indonesia 2018-2020 - Kelapa Sawit. In *Buku Statistik Perkebunan Indonesia*. Sekretariat Direktorat Jenderal Perkebunan, Direktorat Jenderal Perkebunan, Kementerian Pertanian. https://drive.google.com/file/d/1FVxpBNihnuB3ayAALBi-FtsBShlUxMTD/view
5. Ditjenbun. (2020). *Statistik perkebunan unggulan nasional 2019-2021*. In D. Gartina & L. L. Sukriya (Eds.), Sekretariat Direktorat Jenderal Perkebunan, Direktorat Jenderal Perkebunan, Kementerian Pertanian. www.ditjenbun.pertanian.go.id
6. Djadjuli, R. D. (2017). Pelaksanaan pengawasan oleh pimpinan dalam meningkatkan kinerja pegawai, *Dinamika: Jurnal Ilmiah Ilmu Administrasi Negara 4*(4), 565-573. https://jurnal.unigal.ac.id/index.php/dinamika/article/viewFile/879/790
7. Dunie, W. (2018). Pengaruh pengarahan terhadap produktivitas kerja karyawan pada PT. Telkom Belitang Oku Timur. *Jurnal AKTUAL STIE Trisna Negara*, *16*(2), 107-116. https://doi.org/10.47232/aktual.v16i2.25
8. Hermani, A., & Prabawani, B. (2007). Ruang lingkup manajemen produksi dan sistem produksi. *Bahan Ajar Manajemen Operasi* 1, 1–32. Jurusan Administrasi Bisnis, Fakultas Ilmu Sosial dan Ilmu Politik, Universitas Diponegoro. http://eprints.undip.ac.id/27356/1/0178-BA-FISIP-2009.pdf
9. Hidayah, N. (2017). *Evaluasi produksi dengan pendekatan manufacturing cycle effectiveness pada konveksi Lida Jaya Padurenan Kudus*. 9–32. http://repository.iainkudus.ac.id/1855/
10. Irianto, I., & Apriyanto, M. (2012). Analisa mutu minyak kelapa sawit mentah di pom iv nyato pt. Th indo plantations kecamatan pelangiran kabupaten indragiri hilir riau. *Jurnal teknologi pertanian*, *1*(2), 47–56. https://doi.org/10.32520/jtp.v1i2.44
11. Katadata. (2020). *Konsumsi minyak goreng berdasarkan jenis*. Databoks.Katadata.Co.Id. https://databoks.katadata.co.id/datapublish/2020/08/12/konsumsi-minyak-goreng-berdasarkan-jenis
12. Kemenkeu. (2012). *Kajian nilai tambah produk pertanian*. Badan Kebijakan Fiskal, 6. https://www.kemenkeu.go.id/sites/default/files/nilai tambah produk pertanian.pdf
13. Lubis, T. (2017). *Pengaruh perebusan sistem tiga puncak terhadap kehilangan minyak*

pada air kondensat di pabrik kelapa sawit PTPN IV Unit Usaha Mayang Perdagangan. Universitas Sumatera Utara. http://repositori.usu.ac.id/handle/123456789/4718

14. Majidah, Z., Sukidin, & Hartanto, W. (2021). Peranan sektor pertanian dalam pembangunan ekonomi kabupaten Jember (ditinjau dari PDRB, penyerapan tenaga kerja dan indeks harga konsumen). *Jurnal Pendidikan Ekonomi: Jurnal Ilmiah Ilmu Pendidikan, Ilmu Ekonomi Dan Ilmu Sosial*, *15*(1), 97–102. https://doi.org/10.19184/jpe.v15i1.18482
15. Mardhiah, A. (2013). *Pabrik kelapa sawit PT. Perkebunan Nusantara–1 Tanjung Seumantoh-Aceh Tamiang-menghitung losses inti pada fibre cyclone*. Laporan Kerja Praktek. Jurusan Teknik Kimia, Fakultas Teknik, Universitas Malikussaleh.
16. Melisa, & Apriyanto, M. (2020). Pengolahan Limbah Cair Pabrik Kelapa Sawit (Studi Kasus pada PT. Tri Bakti Sarimas PKS 2 Ibul, Riau). *Jurnal Teknologi Pertanian*, *9*(2), 86–93. https://doi.org/10.32520/jtp.v9i2.1281
17. Murti, E. (2015). Pengaruh pembagian kerja terhadap efektifitas organisasi publik di desa Karangrejo kecamatan Kendal kabupaten Ngawi. *Sosial*, *16*(1), 76–92.
18. Nurhayati, N., Sulastri, Y., Ghazali, M., & Ibrahim, I. (2021). Penyuluhan Cara Pengolahan Pangan Yang Baik Untuk Perbaikan Proses Produksi Dan Mutu Minyak Kelapa Di Ikm Sakra Timur Lombok. *JMM (Jurnal Masyarakat Mandiri)*, *5*(1), 152–160. https://doi.org/10.31764/jmm.v5i1.3502
19. Pratama, W. P. (2018). *Kemenperin dorong tiga jalur hilirisasi CPO*. Bisnis.Com. https://ekonomi.bisnis.com/read/20181031/257/855430/kemenperin-dorong-tiga-jalur-hilirisasi-cpo
20. Putri, I.R. (2017). Kerjasama ekspor Crude Palm Oil (CPO) Indonesia ke negara Vietnam pada tahun 2012-2015. *Journal Online Mahasiswa FISIP*, *4*(2), 1-11. https://jom.unri.ac.id/index.php/JOMFSIP/article/view/15554
21. Utami, R. R., & Amalia, A. A. (2019). Optimizing biosurfactant sorbitol ester synthesis enzymetically from fatty acid methyl ester using coarse papaya resin. *IOP Conference Series: Earth and Environmental Science*, *355*(1). https://doi.org/10.1088/1755-1315/355/1/012060

PRODUCTION_MANAGEMENT_OF_CRUDE_PALM_OIL.pdf

ORIGINALITY REPORT

8%	7%	2%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

5%

★ garuda.kemdikbud.go.id

Internet Source

Exclude quotes	On	Exclude assignment template	On
Exclude bibliography	On	Exclude matches	< 1%