

The Effect Of Resting Time To Work Productivity On Surya Hutani Jaya Company

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Abstract: Purbawati, Rachmat M, Ruslim Y, B.D.A.S.Simarangkir. 2016. The Effect of resting time to work produktivity to the activity of Seedling Eucalyptus Pellitawith mini cutting. Productivity is the ratio between the output and the input. Rated productivity indicates how effectively the production process has been empowered to increase the output and how efficiently are also sources of input has been successfully saved. Many factors can affect productivity example is the resting time factor. In this study, which examined is how the influence of rest periods of the Productivity and how much the standard output produced by the female labor force. Research conducted on women workers who are working at the cutting shoots (cutting house). Nurseries with mini cutting process is done by cutting the $\frac{3}{4}$ of the leaves on each leaf so that the remaining 2 to 3 pairs of strands shoots that have undergone a process of cutting in its leaves called ready plant bud (shoot). Ready plant bud is the output of this research, while the input is the time used to do the cutting. This study aims to determine the influence of rest periods of the productivity of female workers and to determine the standard output produced by the female labor force. Data processing method used is the partial productivity measurement methods and measurement methods of working time. The results stated that the amount of labor productivity of women without giving time off is 0.0911 shoots second⁻¹; whereas labor productivity by granting time off for 5 minutes every hour (C1), by granting a 10 minute break every two hours (C2), by granting time off for 30 minutes per one working day (C3), by granting time off for 60 minutes per one working day (C4), and the provision of rest periods combined / mixed, which is 5 minutes every hour and 60 minutes per one working day (C5) respectively is 0,0908 shoots second⁻¹; 0.0761 shoots second⁻¹; 0.0972 shoots second⁻¹; 0.0857 shoots second⁻¹ and 0.0860 shoots second⁻¹. The calculation output standard as many as 277 shoots hour⁻¹ and the average output produced by the female labor force amounted to 299 shoots hour⁻¹. The results of this study could be the basis for the company to give workers time off to the woman for 30 minutes scheduled for 12.00 to 12:30 pm and as a basis for granting incentives to workers who are able to generate an output of more than output standard.

Keyword: Productivity, standart output

Introduction

Surya Hutani Jaya company located in areas Sebulu, KutaiKertanegara, East Kalimantan, Indonesia is a company that produces products in the form of processed wood to be exported out of the country. The processed wood from trees is kind EucaliptusPelita, crassicarpa Acacia and Acacia mangium. The trees were planted in the area of the company through the process of nursery activities. The nursery activities begin with the process of seedling consisting of recruitment is generative, vegetative and mini cutting. This study took place in a mini nursery, observation of mini cutting process against Eucalyptus pellitaseeds. The nursery activities begins with harvesting the shoots in the area sand bed in the mornings, then shoots were taken to a "cutting house" for further recruitment is a mini cutting process. Nurseries with mini cutting process is done by cutting the $\frac{3}{4}$ of the leaves on each leaf so that the remaining 2 to 3 pairs of strands daun. Shoots that have undergone a process of cutting in its leaves called ready plant bud (shoot).

Ready plant bud is the output of this research, while the input is the time used to do the cutting. Mini cutting nursery activities are done by female workers who work with a contract system in which there is no provision of scheduled rest periods and provided by the company that they work continuously. If the labor force works continuously without given a special break to unwind, it can cause errors such as damage to the buds of work resulting from the cutting process and this can affect the productivity. Productivity is the ratio of output to input. Productivity can be used as benchmarks to determine how efficiently the input sources have been used by a company. Many factors can affect productivity, especially labor productivity among other factors and factors situational themselves. Factors themselves were age and years of service whereas situational factors can include time off. In this study, which examined is how the influence of rest periods on labor productivity of women who work at the cutting house and how the increase in labor productivity if given time off different. For the measurement of productivity used the ratio of output to input. Output in the form of shoot. produced by labor through the cutting process so that become seedlings ready for planting, while input in this case is used by the working hours of labor to produce the seedlings ready for planting. This study aims to determine the influence of rest periods of the productivity of female workers at the cutting house and to determine the standard output produced by the female labor force

Literature Review

Productivity is the ratio of output to input, productivity can be used as benchmarks to determine how efficiently the input sources have been used by a company (Singgih, 2012). Many factors can affect productivity, especially labor productivity among other factors and factors situational themselves. Factors themselves were age and years of

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service whereas situational factors can include time off. Output in the form of shoot produced by labor through the cutting process so that become seedlings ready for planting, while input in this case is used by the working hours of labor to produce the seedlings ready for planting. The expected outcome of this study is to be aware of the efficient use of working time in connection with the resulting productivity and can define the default time and production standards as the basis for remuneration by the company so that it can be seen whether or not the provision of respite for women workers. According to Wayne (1978) and Wignjosoebroto (2003) studies or research on productivity has been done by several leaders, among others, Frederick W. Taylor (1881) who began the study of the measurement of working time (Study time), then Henry L. Gantt (1907) who developed the system of remuneration and bonuses work introduces map Gantt (bar chart) as a means of planning and control of work. Followed by Frank B. Gilbert (1909) who publish papers of being famous "Bricklaying System" which is the beginning of a study on labor movement (motion study). According to Singgih (2012), productivity is defined as the ratio between the output and the input. In other words, productivity is the output produced by every single of input. Rated productivity indicates how effectively the production process has been empowered to increase the output and how efficiently are also sources of input has been successfully saved. According to Sumanth (1984), the increase in productivity will occur when the value of productivity increases, that is if the output volume grew while the volume of fixed input, output volume remained while the input volume is reduced, the output volume grows much larger when compared to the increase of the volume of input, output volume decreases much less when compared to the volume reduction of input. Resources-driven economy effectively requires organizational and technical skills so as to have a high level of effectiveness. This means that the result obtained balanced input that is processed through improved ways of working so that waste of time, energy and various other inputs will be reduced as far as possible. The result would be saved, where time is not wasted in vain. Driven power effectively and achieving business objectives can held up well properly, effectively and efficiently. The description is what is meant by productivity (Sumanth, 1985). According to the ILO, in 1969 the productivity can be formulated as follows: Productivity is the ratio between what is produced (output) with what is entered (input). This decision applies to industrial companies and the overall economy. In general, productivity is defined as the relationship between the actual results and physical (goods and services) with the actual input. For example, productivity is a measure of productive efficiency. The system consists of human labor, materials, machinery and equipment and working environment either singly or as a whole will affect the work. The criteria used to measure the success of the work can be a criterion costs, quality and turnaround time associated with the quantity of output (Sutalaksana, 2000). Each worker needs a period of time to master the job. This is shown learning curve or curve adjustment work by workers from getting to know the work until the familiar (Sutalaksana, 2000). According to Loehoer (2002) in Elfarini (2007) and Tunjung Ferries Andriana (2010) is the accumulation combined experience of all obtained through

face to face and interact repeatedly with other natural objects, things, ideas and sensations. Marinus et al (1997) in Herliansyah et al (2006) suggest that specific experience can be measured with a span that has been used on a job or task (job). Purnamasari (2005) in Asih (2006) concludes that an employee who has a high work experience will have advantages in several things including: 1) detecting errors, 2) understand the error and 3) seek the causes of errors. One thing that is very influential on humans to do the job is exhausted. According Suma'mur (1980) fatigue can be regarded as a pattern that arises in a situation that generally occurs in individuals who are not the spirit of the time doing the activity. Scheduling time off is generally done on the basis of consideration of the use of energy consumed for work. For activities that are qualified mild or moderate will take about 10-15 minute break scheduled in the morning or afternoon, beyond the scheduled lunch break, in the period of his working time. For activities that are routine or monotonous like activities that have to do observation / monitoring constantly, it will require a period of rest periods are regulated with greater frequency. Several studies have proved that working time arrangements are interspersed with several breaks, as well as changes in the length of working time period can impact change on the efficiency of the operator. For example, from a result of the study noted by shortening working hours in the factory of 8¼ hours / day to 8 hours / day can result in increased achievement 3% - 10%. The conclusion that can be drawn in this case is to shorten daily working hours will result in an increase in output per hour, contrary to extend the daily hours will lead to slow down the speed (tempo) work which eventually resulted in a decrease in work performance per hour. The total decrease in job performance because of a decline in the pace of work due to fatigue are the main factors underlying cause (Wignjosoebroto, 2003). Singgih (2012), measurement of productivity is very interesting, because it measures the results of human labor with all the problems varied. Labor productivity measurement system according to individual physical input / per-person or per hour of work people are widely accepted, but from the point of view / daily supervision, such measurements are not satisfactory due to the variation in different amounts.

At least two kinds of different levels of comparison, the total productivity and partial productivity.

$$\text{Total Productivity} = \frac{\text{Results Of Total}}{\text{Incorporate Total}} \dots\dots\dots (1)$$

$$\text{Partial Production} = \frac{\text{Total output generated}}{\text{The total workforce employed}} \dots\dots\dots(2)$$

Wignjosoebroto (2003), by doing the rating are expected to work time can be measured normalized again. Abnormalities of working time is caused by operators who work less fair which is working in speed is not as it should be. One time deemed too fast and other times when too slow. Is an assessment that is part of the measurement of the activity of work and to set a standard time of completion of work cannot be a factor ratings (subjectively) the operator work time. To normalize the working time of observation, it is done by make adjustments is by

multiplying the time observations on average by a factor of adjustment / rating "p". Prices of rating factors are: If the factor working too quickly is working above the acceptable limit (normal) then the rating factor (p) will be greater than one ($p > 1$ or $p > 100\%$); If the operator is working too slow to work at speeds below fairness, the rating factor (p) ($p < 1$ or $P < 100\%$); If the operator is working normally, then the rating factor taken equal to one ($p = 1$). The rating is based on these factors, the normal time (W_n) formula can be obtained as follows:

$$W_n = \text{Cycle time} \times \text{Rating factor} \dots \dots \dots (3)$$

Sumanth (1985), standard time is the time required by the worker reasonably normal to complete a job that is run in the best working system. In this case three important terms that must be considered are reasonable, normal and best. It shows that the standard time is sought is not the time of completion of the work carried out improperly, such as too fast or too slow, also not completed by a worker special skilled or sluggish and lazy, and also in the system of the work undertaken by the working methods yet either. The standard time to be set should include all work elements and coupled with concessions (allowances) are necessary. Thus the standard time is equal to the normal time, coupled with loose time. The formulation of standard time (W_b) is:

$$W_b = W_n \times \frac{100\%}{100\% - \text{allowance } \%} \dots \dots \dots (4)$$

Finally, the number of standard products or standard output (OS) can be determined by the following formula:

$$OS = 1/W_b \text{ (units/hour)} \dots \dots \dots (5)$$

Researches on mini cuttings and eucalyptus have been done and some important results are presented here. Wendling et.al.(2010) worked with new mini-cuttings technique, an ex vitro method for clonal propagation of sweetgum and the result is the formation of 62.5% of healthy plants after hardening under outdoor conditions. Another report from Santana et.al.(2010) is leaf size reduction had no influence on clonal production of eucalyptus seedlings. Majada et.al. (2011) reported the use of juvenile material, good environmental conditions and plant growth regulator in *Pinus pinaster* Ait benefited the rooting of clonal material. Cunha et.al. (2012) evaluated the preparation of cuttings and minicuttings for eucalyptus seedling production, with the use of scissors and the results were the posture of workers dealing with cutting preparation requires corrections in short run, the workers had moderate RSI risk due to the high degree of repeatability, and the physical workload was classified as mild, with no need for ergonomic interventions. Masson (2013) studied on chemical control of Eucalyptus Rust, due to restriction of genetic basis of breeding programs, resistance sources have become scarcer and easily overcome by diversity and the variability of pathogens. The length of mini-cuttings and the reduction of leaf area did not effect the nutritional status of the leaves, nor did the length effected the quality of the plants at the age of 90 days Santana et.al. (2013). This report also indicated that it is unnecessary to reduce the leaf area for eucalyptus propagation. Gehlot et.al. (2014) showed different auxins and rooting media on vegetative

propagation of *Azadirachta indica* had significant effect on the Neem establishment.

Materials and Methods

In this study used an experimental method, that is by doing experiments on women workers who were conducting cutting buds. The workers were given a different treatment, that treatment with giving time for rest and treatment without giving time off. The stages were reached in this study is the research locations (study area), sample selection, data collection and data analysis.

Study area

The study was conducted in forest concessions at production forest working area, SuryaHutani Jaya company in KutaiKartanegara of East Kalimantan Province Indonesia (Figure 1). The total area of Surya Hutani Jaya Company is 183300 ha. Based on the Schmidt-Ferguson's climate classification, the forest concession belong to type A climate where the average temperature varies from $22^{\circ}\text{C} - 27^{\circ}\text{C}$ and average annual rainfall varies at 2,500-4,000 mm.

INDONESIA MAP

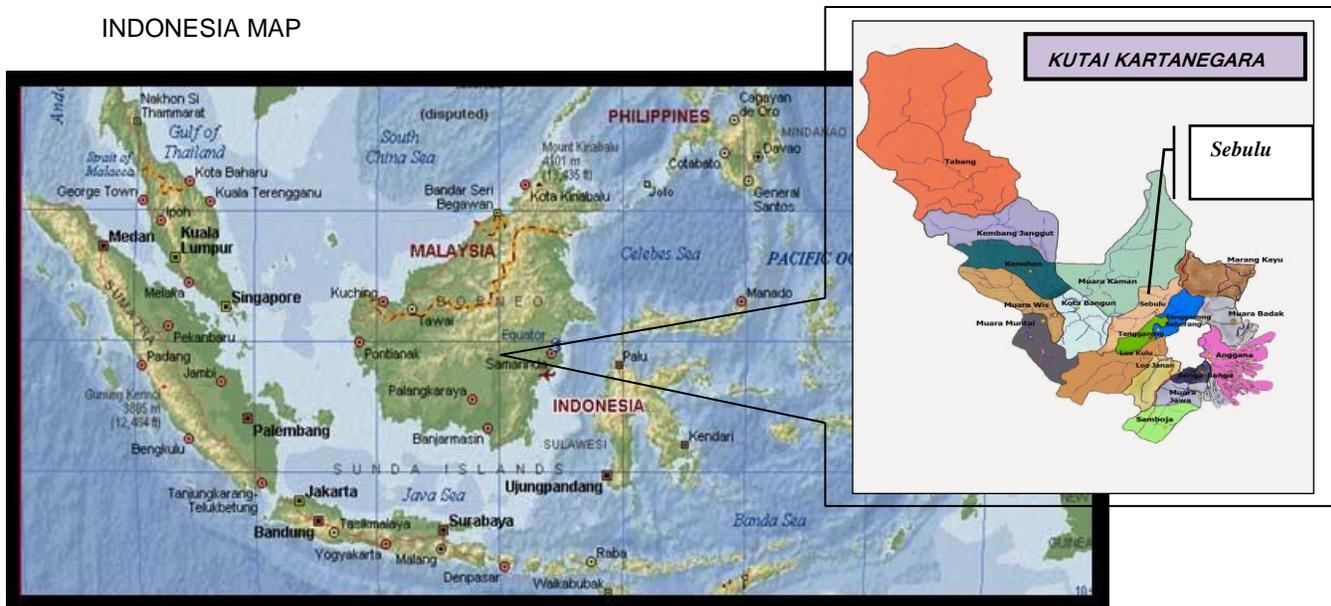


Figure 1. Study area Surya Hutani Jaya Company at SebuluKutaiKartanegara, East Kalimantan, Indonesia.

Research Design

In this study used an experimental method, that is by doing experiments on women workers who were conducting cutting buds. Samples taken as many as 48 people. The workers were given a different treatment, that treatment with giving time for rest and treatment without giving time off. The study design is made in the form of observational data tables consisting of: The study design is made in the form of observational data tables consisting of: Age less than 30 years (a1) and more than 30 years (a2); Work experience or employment for less than 6 months (b1) and more than 6 months (b2); Breaks without break (C0) and the rest (C1, C2, C3, C4, C5), where C0: Without giving time off, C1: By granting time off for 5 minutes per hour of work,

C2: By giving a 10 minute break every 2 (two) hours of work, C3: By granting time off for 30 minutes per 1 (one) working day, C4: By granting time off for 60 minutes per 1 (one) working day, C5: By granting time off for 5 minutes per hour of work and for 60 minutes per 1 (one) working day. Number of shoots produced for each hour of work are Working hours to 1: between 09.00 - 10:00 pm; Working hours to 2: between 10.00 - 11:00 pm; Working hours to 3: between 11.00 - 12:00 pm; Working hours to 4: between 12.00 - 13:00 pm; Working hours to 5: between 13.00 - 14:00 pm; Working hours to 6: between 14.00 - 15:00 pm. While Shoots produced by the labor of women without giving time off in "cutting house" can be seen in figure 2 below:



Figure 2: Shoots produced by the labor of women without giving time off

Results and Discussion

While Cutting Mini process Eucalyptus Pelita shoots are: Cut shoots 3-5 mm below the leaf segments. The segments of the leaf stalks are cut and be left along the ± 2 mm; Cut the leaves perpendicular bone primary leaves leaf surface area

of 2/3, and 1/3 left, while the ends of shoots left; and Submerge the base of shoots in water bactericidal subsequently dipped in a solution of 0.5 gr/l. Process Maturation and shoots Preparation can be seen in figure 3 below:

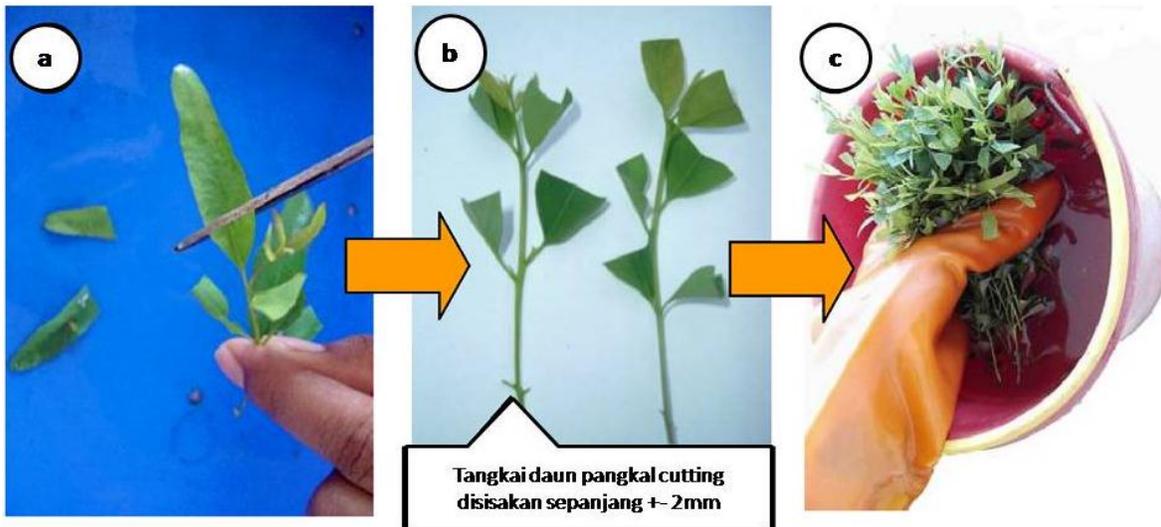


Figure 3: Process Maturation and shoots Preparation: Cutting 2/3 of the leaf, shoots ready for planting, Immersion in a bactericidal solution

Output Data

The resulting output is a type of Eucalyptus Pellita shoot cuttings produced by the female labor force through the cutting process so that it becomes seedlings ready for

planting. Data from cuts of steak shoots up to be ready for planting seeds produced by female workers (output) can be seen in the following table 1 below:

Table 1. Average Output Data

Working hours	C0	C1	C2	C3	C4	C5	amount	Average (shoots)
1	292	263	235	281	226	250	1547	258
2	295	307	235	350	298	306	1791	299
3	327	317	270	341	309	311	1875	313
4	334	297	270	339	Break	Break	1240	310
5	311	313	266	330	310	325	1854	309
6	305	322	266	336	304	298	1830	305
Average (shoots)	311	303	257	330	289	298	1797	299

Input Data

The input data used is the effective working time used by women workers at every hour of work in the process of cutting seedlings with the condition without giving time off

and with the condition of granting time off. Effective working time is the number of normal working time is reduced the amount of idle time (idle time). The result can be seen in the table 2 below:

Table 2. Average Data input to the condition C0 s/d C5

Condition	(a1 - b1)	(a1 - b2)	(a2 - b1)	(a2 - b2)	Input / Hour (Seconds)
C0	3394.06	3515.31	3409.84	3334.83	3413.51
C1	3336.31	3428.58	3262.20	3322.42	3337.38
C2	3373.97	3340.14	3354.10	3443.79	3378.01
C3	3337.72	3345.62	3450.33	3451.10	3396.20
C4	3340.47	3299.25	3413.15	3473.3	3371.01
C5	3462.52	3417.97	3484.02	3491.35	3463.97

Data of idle time (idle time).

Unemployed at the time of data per hour of work, or often called allowance obtained from observations of the workforce who perform activities that are not productive like

eating, drinking, into the bathroom, picked up the phone, chatting and others. Such data can be seen in the following table 3 below:

Table 3. Data on average idle time

working hours	C0	C1	C2	C3	C4	C5	Average (Seconds)	Average (Minutes)
1	446.37	776.75	400.39	811.12	792.75	646.05	645.57	10.76
2	231.35	118.26	400.39	125.76	163.24	142.41	196.90	3.28
3	207.10	211.60	143.43	180.73	74.18	58.32	145.90	2.43
4	330.91	358.44	143.43	184.07	Break	Break	254.22	4.24
5	59.1	450.77	140.16	97.68	102.07	204.81	175.77	2.93
6	82.08	31.37	140.16	102.32	123.11	40.53	86.60	1.44
Average Allowance								4.18

Data of working time

Observations Rating factor against female workers conducted by researchers, then adjusted to the values in the table Westinghouse, and the obtained values are as follows: Skill good (C2)= (+ 0.03), Effort good (C1)= (+ 0.05), Condition Fair (E) = (- 0.03), Consistency Good (C) = (+ 0.01), Total = +0.06. The observations are then added to 1 so the value rating factor is 1.06. From the table output and input table gained an average output and average input, while the average allowance can be seen in table idle

time, and the results are as follows: average output (number of shoots) = 299 shoots hour⁻¹; average input (effective working time) = 56.45 minutes hour⁻¹ ; the average allowance = 4.18 minutes hour⁻¹ .

Calculation of Work Productivity

The result of the calculation of labor productivity for each condition (C0 - C5) can be seen in the following table 4 below:

Table 4. Results of calculation of labor productivity in conditions of C0 - C5

Condition	Output (shoots)	Input (second)	Productivity (shoots second ⁻¹)
C0	311	3413.51	0.0911
C1	303	3337.38	0.0908
C2	257	3378.01	0.0761
C3	330	3396.2	0.0972
C4	289	3371.01	0.0857
C5	298	3463.97	0.0860

While labor productivity chart women can be seen in Figure 3 below:

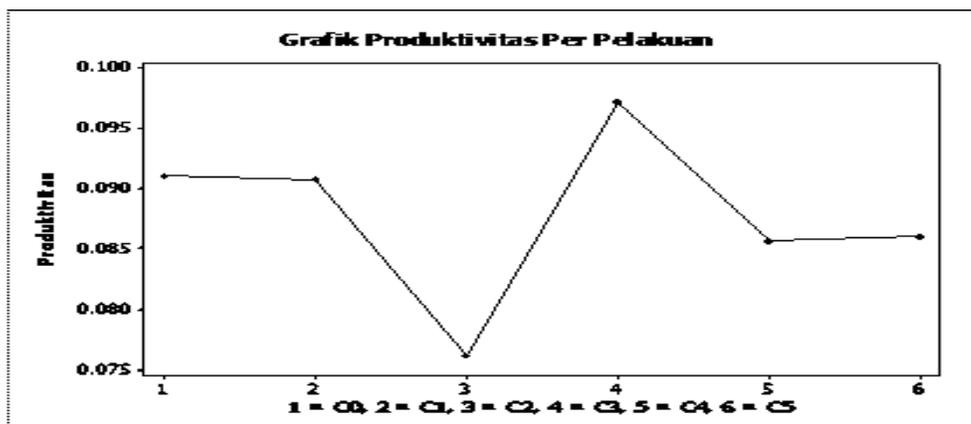


Figure 3: Graph labor productivity to ensure C0 - C5

The calculation of output standar

The result of the calculation of output standard can be seen:

From data ; Rating factor= 1.06 ; Cicle time = 0.19 menit
shoots⁻¹; Normal time = 0.00336 hour shoots⁻¹

Allowance= 4.18 menit (table 7) = 0,0696667 hour =
6,96667 % and standar time = 0.00361 hour shoots⁻¹so
output standar = 277 shoots hour⁻¹

Fatigue caused by work is often interpreted as a decline in the efficiency of the process, work performance, and decreased strength / endurance physical body to continue the activities that must be performed. There are several kinds of fatigue such as muscle fatigue, visual fatigue, mental fatigue and tired monotonis. The onset of fatigue in human beings is a process that accumulates on the various factors that could cause tension (stress). To avoid excessive accumulation of the necessary balance between the input source of the coming exhaustion (factors that cause fatigue) with the amount of output obtained through the recovery process. The recovery process can be done by, among others, provide adequate rest periods, whether scheduled or not. From the results of calculations known that the level of labor productivity of women without giving time off (C0) amounted to 0.0911 shoots second⁻¹ while the rate of labor productivity by giving time break for the conditions C1, C2, C3, C4 and C5 are respectively 0.0908 shoots second⁻¹; 0.0761 shoots second⁻¹, 0.0972 shoots second⁻¹; 0.0857 shoots second⁻¹; and 0.0860 shoots second⁻¹. From these results can be seen that the level of labor productivity is the highest at 0.0972 shoots second⁻¹, which is in work productivity by providing a rest for 30 minutes per 1 (one) working day, while the lowest labor productivity amounted to 0.0761 shoots/second that exist in productivity by giving a 10 minute break every 2 (two) hours of work. This is because the provision of time off for 30 minutes felt was enough for the body of the female labor force in order to restore/recover strength/physical energy after working for a few hours so that the body can be refreshed and can be used for work again, while granting time off for 10 minutes per two (2) hours is too short for the body to be able to eliminate the physical fatigue after working for two (2) hours, so that the body of the female labor force was still not yet recovered his strength to get used to working again. In addition, the causes of low productivity of labor in the delivery time of rest for 10 minutes per two (2) hours of work this is because more labor idle time is used, as a result even though they've been resting for 10 minutes but the resulting output is relatively not too much. From the calculations, the standard time for 0.00361 hour shoot⁻¹ and standard output as much as 277 shoots hour⁻¹, which means that women workers should be able to complete the job cuts each helm during 0.00361 hours. Ouput that has been produced by the female labor force as much as 299 shoots hour⁻¹, which means that the work force has resulted in output over 22 shoots hour⁻¹ of output that should (standard output). For the company, so

that the company can recommend to given time off to female workers during the 30 minutes scheduled for 12.00 - 12:30 pm so that workers have enough time to rejuvenate the body after working for a few hours, and that the company could provide an incentive to the women workers who are able to produce output above 277 shoots hour⁻¹.

Conclusions

From the results of calculations known that the level of labor productivity of women without giving time off (C0) amounted to 0.0911 shoots second⁻¹ while the rate of labor productivity by giving time break for the conditions C1, C2, C3, C4 and C5 are respectively 0.0908 shoots second⁻¹; 0.0761 shoots second⁻¹, 0.0972 shoots second⁻¹; 0.0857 shoots second⁻¹; and 0.0860 shoots second⁻¹. The standard time required by female labor to produce each bud seedlings is 0.00361 hour shoots⁻¹; whereas the standard output produced by women workers at every hour of work amounted to 277 shoots hour⁻¹.

Acknowledgments

We would like to thank staff of Surya Hutani Jaya Company, who have supported us with facilities for research, accommodation, and transportation during the study. We are also indebted to cork oak forest owners for allowing this study in their forests.

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