

# Analysis of Measurement And Determination Production Standard in *Jerebeng* Small Medium Enterprises

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## Abstract:

Industrial *jerebeng* the establishment of small and medium enterprises (SME), which many have encountered in the Sidoarjo region that already famous for its cracker company, one of the villages that run this *jerebeng* industry is in the village Sumpat. In this Sumpat village, approximately ten people who make this *jerebeng* making industry became his livelihood. *Jerebeng* itself is a tool or a place used for drying and oven processes crackers and bamboo. The business of making *jerebeng* discount constraints on production factors, among others, labor, machinery, equipment, raw materials, processing time, and how the costs used in the process of making this *jerebeng*. During this *jerebeng* industry not have a standard size for the standard time, the standard quantity of raw materials, standard production cost, labor required, as well as the profits derived, in the manufacturing process *jerebeng*. Research performed on small and medium enterprises manufacture *jerebeng* to produce standard references such production, that production *jerebeng* has 23 process activities. Then calculate the result in that the time required for the manufacturing process *kasandra jerebeng* 20.51 minutes while *galaran jerebeng* of 33.82 minutes. So from knowing long, it takes for the production process can be calculated production cost requirements for each type of *jerebeng*. *Kasandra jerebeng* Rp. 3812 while *galaran jerebeng* Rp. 7180. The cost components include raw materials, labor, and overhead costs. In this study were also given an overview of demand forecasting *jerebeng* products that can be used to calculate some costs and capital required businesses.

**Keywords:** Measurement of working time, Production standards, Bamboo *Jerebeng*, Small and medium enterprises.

## 1. INTRODUCTION

Efforts to increase profits and win the competition could not be separated from the support of an important function in the company, namely the production function. The production function in a company is not only limited to the base features, such as adding or creating added value for its products usability and utilize available resources. However, in general, serve to transform inputs into outputs with a predetermined quality of the company. In effect, the production activities will be carried out if the possible factors of production, including the most basic is the form of labor, capital, raw materials and auxiliary materials and methods were applied<sup>1</sup>. Production and operations management are attempting optimal management of resources or factors of production such as labor, machinery, equipment, raw materials.

In the industrial world, the working time is one factor that is important and needs attention in its application. Working hours play a role in determining the work productivity and can be a benchmark for determining work standards and work methods are appropriate in the completion of the work<sup>2</sup>. Small and Medium Enterprises (SMEs) are often faced with several problems, among others from the capital, the ability of business management, and quality of human resources managers<sup>2</sup>, difficulties in accessing information and productive resources such as capital and technology, causing the limitations of small businesses to thrive<sup>3</sup>

*Jerebeng* industry is a form of small and medium-size enterprises (SMEs), which are found in the Sidoarjo region are already popular with many companies crackers, one village who run this industry is in the village *jerebeng* Sumpat. In this Sumpat village, approximately ten people who make making industry *jerebeng* this became his livelihood. *Jerebeng* itself is a tool or a place used for drying and oven processes crackers and

bamboo. The business of making *jerebeng* discount constraints on production factors, among others, labor, machinery, equipment, raw materials, processing time, and how the costs used in the process of making this *jerebeng*.

During this *jerebeng* industry not have a standard size to determine the standard time, the standard quantity of raw materials, standard production cost, labor required, as well as the benefits obtained. Therefore, to determine labor, raw material and production expenses in this study measured working time, calculating the quantity of raw materials, the analysis of the costs incurred in conducting the production *jerebeng*, as well as demand forecasting to help determine the need for labor, raw materials, and the costs involved.

- **Jerebeng**

*Jerebeng* to be addressed in this study is *jerebeng* kind *Kasandra* and *galaran*, overall actual *galaran jerebeng* same process as the manufacturing process *kasandra jerebeng*, but in the course *jerebeng galaran* there are thinning process bamboo and wicker.

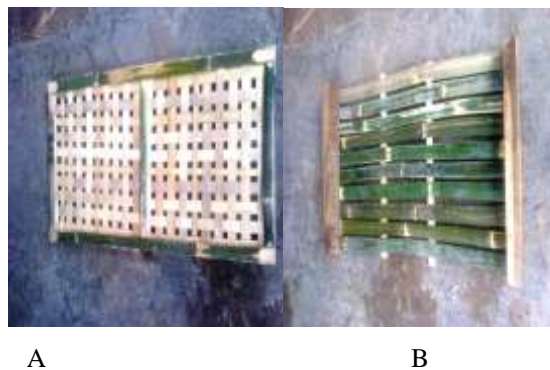


Fig. 1. A. *Galaran Jerebeng* B. *Kasandra Jerebeng*

*Kasandra jerebeng* and *galaran jerebeng* also difference available on the clamp (frame). In the clamping process *jerebeng galaran*, clamp nailed on wood that resembles a palette. Here's is the stage of the manufacturing process and *galaran kasandra jerebeng*:

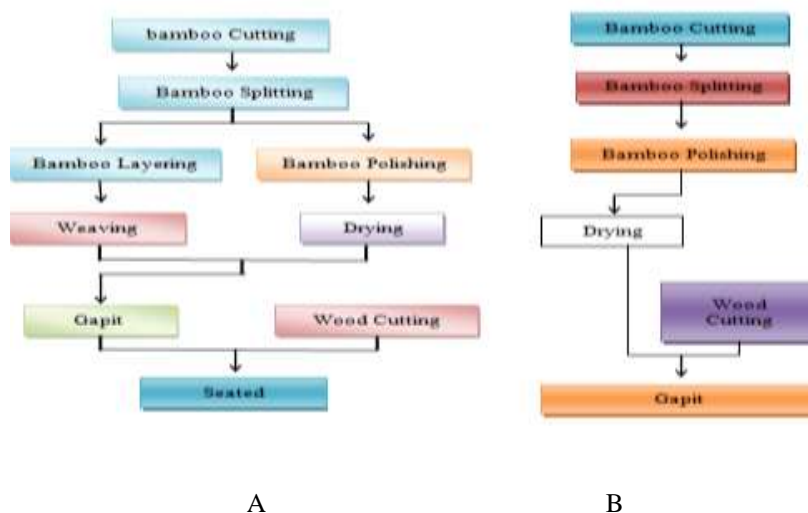


Fig. 2. Flowchart of making A. *jerebeng Kasandra* B. Flowchart manufacture *galaran Jerebeng*

## 2. EXPERIMENTAL DETAILS

This study begins by identifying the theories needed for analysis to be used, concerning the book, research journals, scientific articles, as well as documents related to the research topic, namely the measurement of working time, raw materials analysis, cost analysis, and forecasting. The next stage is a field study, by direct observation and interviews to the *jerebeng* businessman with business owners to obtain information about the process of making *jerebeng*, raw material costs, personnel costs and other expenses<sup>4</sup>.

After conducting a study of literature and, later field studies to identify the problem following the conditions specified companies and research purposes. In the identification of this issue, researchers found that *jerebeng* effort has yet to have a benchmark or standardization of production regarding both labor time and cost. Further, discuss the formulation of the problem for any direct problems that will be solved in the research<sup>5</sup>. That problem is how to make the measurement of working time of production and cost analysis on the *jerebeng* effort. Of these problems, the purpose of this study was to determine the standard time of production and also some the costs used in the process of making this *jerebeng*.

Further data collection to obtain data on raw materials and labor time per each division using field observations and interviews to determine the image directly on the manufacturing process *jerebeng*. After the data collected then calculate the production work time, cycle time calculations will be calculated the time between completion of two consecutive meetings, assumed constant for all sessions. Cycle time can be said, is the result of direct observations contained in the stopwatch<sup>67</sup>. Once the data have been obtained will be calculated to ensure that the data collected has been quite objectively. Testing the adequacy of the data carried out based on statistical concepts. Namely the degree of rigor and the level of confidence/trust. The standard of severity and the degree of confidence is reflecting the degree of certainty desired by the gauges after deciding not perform measurements in large numbers (population)<sup>8</sup>. Upon completion of the test, the adequacy of the data will be calculated the standard time that is the way that has considered working hours adjustment factor, the average cycle time multiplied by the tolerance factor . The time value obtained here still can not we set as the standard time for the completion of an operation because here factors associated with the grace (Allowance Time) to work at their best operators are still not linked. The next stage is the stage hard time calculation after calculation cycle time, test the adequacy of the data and the normal time was then calculating standard time is the actual time the operator used to produce one unit of the data types of products<sup>6</sup>. The standard time for each part must be declared include leeway to rest to overcome fatigue or to factors that can not be avoided. But the period of its use of standard time limits. Thus the standard time can be obtained. Once in the know on the above calculation at this stage will be analyzed what is the standard use of raw materials in the manufacture<sup>9</sup> of *jerebeng* and estimate of production costs such as raw materials needs to be done a calculation of how the raw materials to be used in the manufacturing process *jerebeng* this, and what is the cost of raw materials used in the process. Non-production costs incurred apart from the costs incurred for the production. The next stage will be made forecasting<sup>10</sup>, to determine the market demand for *jerebeng*. So it can find the human resources needed to meet demand. After forecasting production target can be known, so at this stage can be calculated raw materials, cost, and proposals human resources needed to meet demand.

After the measurement of working time, analysis of the use of raw materials, cost analysis, forecasting, and the proposed labor is done in industry *jerebeng* this, then it can be concluded from the research that has been conducted to answer the research objectives and given suggestions such as the implications of the research results or suggestions for further research that can be done<sup>9</sup>.

## 3. RESULTS AND DISCUSSION

In the data collection activities in this case is divided into primary and secondary data. Primary data were collected by direct observation and interviews and discussions with the owners of SMEs. The observations made in the form of sampling observation of work, the number of products each operator and rating factor as well as the allowance of each operator<sup>11</sup>. The collection of secondary data obtained from interviews with SME owners which includes data on the number of actual labor, raw materials, labor costs, as well as working hours. In the manufacture of SMEs *jerebeng* there are 23 work processes, work processes to process 16 *jerebeng Kasandra*, and 7 work processes to *jerebeng galaran*. Data collection is done directly in the field using a stop watch time study. Before the next calculation process done uniformity test data on bamboo cutting process with the result of 23.98 seconds the upper control limit and lower control limit of 21.89 seconds.

In the next process test, the adequacy of the data obtained calculations that express the data  $N > N$  'which means the data sufficient for the next calculation. By assigning a rating performance of 1.08 and further known cycle time, normal time and standard time can be in the know as follows:

Table 1. Results of Uniformity Test Data Process

No	Process Activities	Times (Second)
1.	Cutting Bamboo	22,93
2.	Splitting bamboo long Galaran	49,93
3.	Splitting bamboo short Galaran	44,87
4.	Splitting bamboo long Kasandra	54,43
5.	Splitting bamboo short Kasandra	43,18
6.	Short layer clampkasandra	18,78
7.	Long layer clamp kasandra	22,42
8.	Short layer clamp galaran	16,32
9.	Long layer clamp galaran	20,35
10.	Layering long bamboo	64,31
11.	Layering short bamboo	49,75
12.	weaving	149,125
13.	Wood cutting for ganjel	5,93
14.	Frame (clamping) kasandra	112,75
15.	Frame (clamping) galaran	403,125
16.	Install ganjel kasandra	62,43
17.	Layering long bamboo layer	96,18
18.	Wood cutting for galaran	14,62
19.	Layering bamboo for center gapit	40
20.	Layering bamboo for selukat	40,5
21.	Center gapit layer	14,93
22.	Making selukat	14,64
23.	Layering short bamboo layer	67,18

Table 2. The process of making *jerebeng galaran*

PROCESSING JEREBENG GALARAN	TIME STUDY			RAW MATERIAL REQUIREMENT			7 (3x6)
	1 CT	2 NT	3 ST	4 Requirement	5 Results	6 Req/Res	
<b>Work Process A</b>							
Cutting bamboo for long galaran	22,93	24,77	6,03	11	6	1,83	11,0349
Cutting bamboo for short galaran	22,93	24,77	36,03	4	8	0,5	18,015
Splitting bamboo for long galaran	49,93	54,93	69,38	11	6	1,83	126,9654
Splitting bamboo for short galaran	44,87	49,36	59,23	4	8	0,5	29,615
Wood cutting for galaran	14,62	16,08	18,38	2	1	2	36,76
<b>Total</b>							<b>222,3903</b>
<b>Work Process B</b>							
Clamp layer for long galaran	20,35	22,39	25,5	11	1	11	280,5
Clamp layer for short galaran	16,33	17,96	20,05	4	1	4	80,2
<b>Total</b>							<b>360,7</b>
<b>Work Process C</b>							
frame (Clamping) galaran	403,12	443,43	495	1	1	1	495
<b>Total</b>							<b>1438,7903</b>
<b>Total</b>							<b>1438,7903</b>
<b>Total Time for Making a Jerebeng kasandra</b>							<b>2028,8806</b>

\* total process of making *jerebeng galaran* per unit of 33.82 minutes

Table 3. The process of making *jerebeng Kasandra*

PROCESSING JEREBENG KASANDRA	TIME STUDY			RAW MATERIAL REQUIREMENT			7 (3x6)
	1 CT	2 NT	3 ST	4 Requirement	5 Results	6 Req/Res	
<b>Work Process A</b>							
Cutting bamboo for Clamp	22,93	24,77	36,56	8	8	1	36,56
Cutting bamboo for long split	96,18	105,8	120,92	1,25	8	0,15	18,138
Cutting bamboo for short split	67,18	73,9	82,5	2,5	8	0,31	25,575
Splitting bamboo for long kasandra	54,43	59,88	75,63	4	8	0,5	37,815
Splitting bamboo for short kasandra	43,18	47,5	57	4	8	0,5	28,5
Splitting bamboo for long split	96,18	105,8	120,92	1,25	8	0,15	18,138
Splitting bamboo for short split	67,18	73,9	82,5	2,5	8	0,31	25,575
<b>Total</b>							<b>190,301</b>
<b>Work Process B</b>							
Gapit layer for short kasandra	18,78	20,66	23,06	4	1	4	92,24
Gapit layer for long kasandra	22,42	24,67	28,19	11	1	11	310,09
Splitting bamboo for center clamp	40	44	46,93	1	5	0,2	9,388
Splitting bamboo for selukat	40,5	44,55	47,52	1	5	0,2	9,504
Layer of center clamp	14,93	16,42	17,14	1	1	1	17,14
Making selukat	14,64	16,1	17,18	1	1	1	17,18
<b>Total</b>							<b>455,54</b>
<b>Work Process C</b>							
Layering long bamboo	64,31	70,74	82,82	10	8	1,25	103,525
Layering short bamboo	49,75	54,72	62,54	20	8	2,5	156,35
Weaving	149,12	164,03	183,11	1	1	1	183,11
<b>Total</b>							<b>442,985</b>
<b>Work Process D</b>							
Frame (clamping) kasandra	112,75	124,02	141,74	1	1	1	141,74
<b>Total</b>							<b>141,74</b>
<b>Total Time for Making a Jerebeng kasandra</b>							<b>1230,566</b>

\* total process of making *jerebeng galaran* per unit of 20.51 minutes

then note the cost of production for each product *galaran* or *kasandra jerebeng*, as can be seen in Table 4 below:

Table 4. production costs for *jerebeng*

PRODUCTION COST FOR JEREBENG			
KASANDRA		GALARAN	
Raw Materials	Cost (Rupiah)	Raw Materials	Cost (Rupiah)
Clamp for 0,4 m	320	Clamp for 0,7 m	2090
Clamp for 0,8 m	640	Clamp for 0,5 m	440

Bamboo layer 0,4 m	200	Wood	1500
Bamboo layer 0,8 m	200	Snail 1 inch	220
Wood seated 0,08 m	300	Snail 1 ¾	170
Center clamp	5	Labour	2651
snail 1 inch	50	overhead	109
snail 1 ¼ inch	96		
Labour	1952		
overhead	49		
TOTAL	3812	TOTAL	7180

#### 4. CONCLUSION

Research on small and medium enterprises can indeed provide its color, especially with the theoretical touches that can help businesses to have production standards. As well as the research that has been carried on small and medium enterprises manufacture *jerebeng* to produce standard references such production, that production *jerebeng* has 23 process activities.

Then calculate the result in that the time required for the manufacturing process *jerebeng Kasandra* 20.59 minutes while *jerebeng galaran* of 33.81 minutes. So from knowing long, it takes for the production process can be calculated production cost requirements for each type of *jerebeng. Kasandra Jerebeng* Rp. 3812 while *jerebeng galaran* Rp. 7180. The cost components include raw materials, labor, and overhead costs.

In this study were also given an overview of demand forecasting *jerebeng* products that can be used to calculate some costs and capital required businesses. So overall this research is expected to provide remedies to the problems of production for the business of making or becoming a reference *jerebeng* bamboo businesses that have similar processes.

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