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Analysis of Production Cost Calculations in Bio Seeding Block Based on Sugarcane Waste

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***Abstract*—Bio seeding block is a soil block seedling based on sugarcane waste. It is environmentally friendly, practical, and rich in organic materials. Sugarcane waste has only been used as animal feed and fuel. The novelty of the Bio seeding block is soil block seedling based on sugarcane waste that does not use polybag plastic, it can be used directly for horticultural plant seed nurseries. There are 2 aims in this research, there are: a) To know the production process for Bio Seeding Block based on Sugar cane waste and b) To analyze and calculate production cost for Bio Seeding Block based on Sugar cane waste. Technological innovations developed from Bio seeding block products are using sugarcane waste (bagasse, sugarcane filter cake, and ash) as raw materials for making instant block seedlings. From a technological aspect, sugarcane waste processing is relatively simple and can be carried out by the community. The tool for making Bio seeding block products can also be made simply and can be applied by the community. The main material of the Bio seeding block product is sugarcane waste which has a water content ranging from 46-52%, fiber content 43-52%, and dissolved solids around 2-6%. Based on the total production cost calculations, the production cost per unit for Bio Seeding Block is Rp 3.800,00. For the selling price, it needed to add the advantage target (45%). The selling price for Bio Seeding Block based on sugarcane waste is Rp 5.500,00 per unit.**

Keywords—Bio Seeding Block, Cost Calculation, Sugarcane Waste.

I. INTRODUCTION

Bio seeding block is a soil block seedling based on sugarcane waste. It is environmentally friendly, practical, and rich in organic materials. Sugarcane waste has only been used as animal feed and fuel. The novelty of the Bio seeding block is soil block seedling based on sugarcane waste that does not use polybag plastic, it can be used directly for horticultural plant seed nurseries. In the market, more people use planting media containing polybag plastic which is not environmentally friendly. Bio seeding block product was developed as agricultural product innovation.

This block seedling consists of bagasse, sugarcane filter cake, and sugar cane ash. Bagasse has water content ranging from 46-52%, fiber content 43-52%, and dissolved solids around 2-6%. The utilization of sugarcane waste as a planting medium is very beneficial for plant growth [1].

Besides bio seeding block productions, the important thing to achieve company goals is to calculate production costs. Several things that need to pay attention to in determining cost are understanding costs products and cost elements. Generate profits as expected can be resulted by calculating the right selling price and right cost productions [2]. There are 2 aims in this research, there are: a) To know the production process for Bio Seeding Block based on Sugar cane waste and b) To analyze and calculate production cost for Bio Seeding Block based on Sugar cane waste.

II. LITERATURE REVIEW

2.1 Costs for Production Product Elements

Costs for production products are the cost that needs to spend for making several items in a production period [3]. There are 3 groups of costs for production product:

a) Raw Material's Cost (Cost for material that is directly attached to the product). Raw material costs are costs for materials that are traced easily to the product, traced physically, and be part of the finished product.

b) Direct Labor's Cost (Cost for labor that is directly attached to a product). Direct labor's cost is a cost that is attached to the finished product. One of the examples of direct labor costs is manual labor cost because direct labor usually uses handwork on products for production times.
c) Overhead Factory (Manufacturing Overhead). Manufacturing overhead or overhead factory is a cost that includes all expenditure especially cost for production. Direct materials and direct labor are not included in these costs.

2.2 Aims for Production Costing

Production cost calculations need to consider carefully because the right production cost calculations will make the company's goals achieved. There are several aims for determining production cost such as:

a) Calculate the selling price for production. A company or industry can determine and calculate its selling price by knowing the production's cost. Company management also considers there are several factors include in calculate selling price, such as government interference and market condition, especially in the same are area or products.
b) Monitoring the realization of production costs. Monitoring production's cost realization can be done by knowing and calculating all information of costs for actual production, that is included in production plans. Cost for accounting is an important thing that is needed to collect information on production costs. This information is needed to monitor the production process, all costs for production, and all the calculations before.
c) Calculates and analysis regular income. Company management needs production costs' information that has been included to produce products in a certain period. The purpose is to know the marketing and production and activities are capable of making a gross profit or resulting in a gross loss.
d) Determine the cost of product inventories. Company management needs to analyze the cost of finished product inventory. Management also needed to calculate the cost for production. All the costs for production in one period must be recorded [4].

III. RESEARCH METHODS

3.1 Research Types

The data used in this research is quantitative. Quantitative data is systematic and associated with the problem posed. Quantitative research using an approach that shows research comes from the fact that occur in the field.

3.2 Methods of Data Collection

Methods of data collection in this research are divided into several steps, such as:

1. Documentation.
   Documentation is a data collection technique by analyzing the data that has been collected from the object of research. All data in this research has been collected from the Industri Gula Glenmore (Glenmore Sugarcane Industry)

2. Observation.
   Observation is a data collection technique by direct observation of the research object.

3. Interview.
   The purpose of an interview is to know the number of materials and to collect all data from respondents.

3.3 Time and Place of Research

This research was conducted at Industri Gula Glenmore (Glenmore Sugarcane Industry). The timeline for this research is May – November 2021.

IV. RESEARCH RESULT

4.1 Production Process of Bio Sedding Block based on Sugarcane Waste

Technological innovations developed from Bio seeding block products are using sugarcane waste (bagasse, sugarcane filter cake, and ash) as raw materials for making instant block seedlings. From a technological aspect, sugarcane waste processing is relatively simple and can be carried out by the community. The tool for making Bio seeding block products can also be made simply and can be applied by the community.

The main material of the Bio seeding block product is sugarcane waste which has a water content ranging from 46-52%, fiber content 43-52%, and dissolved solids around 2-6%. The chemical composition includes: charcoal or carbon (C) 23.7%, hydrogen (H) 2%, oxygen (O) 20%, water (H2O) 50% and sugar 3% [1]. Bio Seeding Block Production Process and all the ingredients can be shown in Fig 1.

Fig 1. Bio Seeding Block Production Process

The stages of the production process of the Bio seeding block are shown in Fig.2.

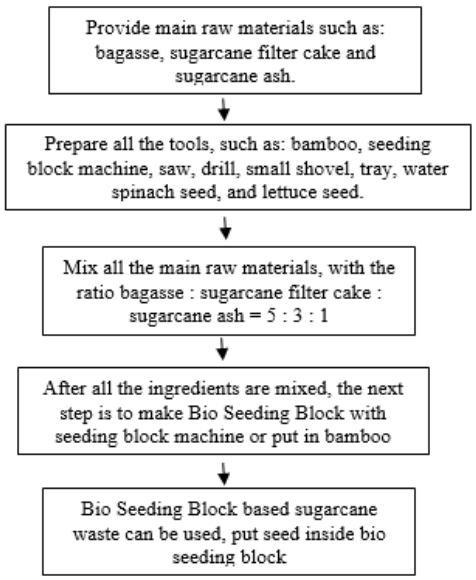

Fig 2. Production process stages of Bio seeding block

There are two types of Bio Seeding Block based on Sugarcane Waste. The first type has block shapes and the second type has a cylinder shape. Bio Seeding Block products in Fig.3.

Fig 3. Bio Seeding Block based on Sugarcane Waste

4.2 The calculation for Production Cost

One of the important elements that are needed by the company is calculating the production costs. The right calculation for production cost can make much profit. Production cost is the costs analysis when producing a product, starting from materials that are still raw to the final process. Calculation of cost of Bio Seeding Block determines three components in it, namely material costs, direct labor costs, and factory overhead costs [5].

1. Cost for Raw Material

Cost for raw material is costs to analyze materials, especially those that are still raw and for processing. Material that is still raw is the basic material that will be used to produce a final product and products that are ready to sell [5]. Detail for Raw Material Costs can be shown in Table.1.

Table 1. Raw Material Costs

No	Cost Detail	Amount	Price per Item (Rp)	Total Price (Rp)
1	Filter cake sugarcane	1	1,000	1,000
2	Baggasse sugarcane	1	5,000	5,000
3	Ash sugarcane	1	1,000	1,000
4	Bamboo	1	10,000	10,000
5	Water Spinach seed	1	45,000	45,000
6	Lettuce seed	1	20,000	20,000
7	Wood	1	25,000	25,000
8	Label Sticker	1	1,000	1,000
9	Packaging	1	2,000	2,000
Total				110,000

2. Cost for Direct Labor

Labor costs in a company are divided into two costs, such as costs for direct labor and costs for indirect labor. Cost for direct labor are costs that labor is included in the process. These costs are also attached to the final products [4]. Direct labor rates to process Bio Seeding Block based on Sugarcane Waste is a fee for production laborers that is Rp 70,000,00/day.

3. Costs for Overhead

Costs for overhead costs are costs that are excluded in costs for material that is still raw and costs for labor that is attached to the final product. Overhead costs are costs that include in the production activities. Detailed overhead costs can be shown in Table.2.

Table 2. Overhead Costs

No	Cost Detail	Amount	Price per Item (Rp)	Total Price (Rp)
1	Seeding Block Machine	1	500,000	500,000
2	Drill	1	935,000	935,000
3	Wood Saw	1	35,000	35,000
4	Small shovel	2	30,000	30,000

5	Marketing labor	1	70,000	70,000
6	Electricity	1	150,000	150,000
Total				1,720,000

4. Production Cost Calculation per Unit

Production Cost Calculations can be analyzed by adding costs for material that is still raw, costs for labor that is attached with final products, and overhead costs. Total production cost calculation for Bio Seeding Block-based Sugarcane Waste can be shown in Table.3.

Table 3. Total Production Cost Calculations

No	Cost Detail	Total Price (Rp)
1	Raw Material Costs	110,000
2	Direct Labor Costs	70,000
3	Factory Overhead Costs	1,720,000
4	Total Production Costs	1,900,000
5	Number of Bio Seeding Block	500
6	Production Cost per Unit	3,800

Based on the total production cost calculations, the production cost per unit for Bio Seeding Block is Rp 3.800,00. For the selling price, it needed to add the advantage target (45%). Therefore the selling price is :

Rp 3.800,00 + (45% x Rp 3.800,00) = Rp 5.510,00

The selling price for Bio Seeding Block based on sugarcane waste is Rp 5.500,00 per unit. This selling price is already appropriate because a high selling price will make a product can't compete in the market compare with other companies, while a low selling price will not provide benefits for the company [6]. To calculate bio seeding block production costs, firstly we need to understand how to make bio seeding block by knowing the production's process. After knowing the production's process, we can calculate all the costs that are included in the production's process.

V. CONCLUSION

Based on the analysis and evaluation of the determination of the cost for production, it can be concluded that the application of cost for production is very important for a company especially to know the price selling of products. From the research that has been done, it can be concluded that:

1. Technological innovations developed from Bio seeding block products are using sugarcane waste (bagasse, sugarcane filter cake, and ash) as raw materials for making instant block seedlings. From a technological aspect, sugarcane waste processing is relatively simple and can be carried out by the community. The tool for making Bio seeding block products can also be made simply and can be applied by the community.
2. Based on the total production cost calculations, the production cost per unit for Bio Seeding Block is Rp 3.800,00. For the selling price, it needed to add the advantage target (45%). Therefore the selling price for Bio Seeding Block based on sugarcane waste is Rp 5.500,00 per unit.

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