

Economic Empowerment for Santri By Making Pulp Paper in Dayah of Ulumuddin, Lhokseumawe

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Abstrak – *Ulumuddin foundation situated between the coastal area and forest area is surrounded by traditional and industry plantation. The foundation has been holding some boarding school education such as SDIT, MTs, MA, and SMK, and especially Traditional Islamic School (Dayah). Most of santri look like lack of living cost because they only hope the morney from their parent who is only pre whealfers' family. Given these circumstances, an effort was needed to improve the santris' life. A partnership in technology, mentoring and capital provision was taken through the Ipteks bagi Masyarakat (IbM) Program. A design of big blender was prepared and introduced to two group of santri. A group of ten santri was involved to the program of making pulp system technology aimed to increase the partners' revenue. The results of the cost analysis concluded that the rate of return was 30%; the Break Event Point (BEP) was Rp.7.500/kg pulp; and return of inverment period was 0.6 years in-service. Copyright © 2017 Department of Mechanical Engineering. All rights reserved.*

Keywords: *pulp, rabish, paper, banana tree, dried leaf*

1 Introduction

Ulumuddin foundation located in Village of Uteuen Kot - Cunda, Sub – district of Muara Dua, Lhokseumawe is one of the foundations where organizes dayah / pesantren education and Integrated Islamic Primary School (IIPS), Madrasah Tsanawiyah, Madrasah Aliyah and Vocational High School situated on 2.5 Ha land area based on Notarial Deed. 50 Dated March 23, 1988. With this integrated education system, almost all students are harassed; their living expenses are a serious problem must faced by stakeholders. Given these conditions need to be an effort to improve the economy and require partners to create science and technology, guidance, assistance and granting of venture capital. Therefore, the design of paper-making technology needs to be directed to increase the income of santri. Pulp Paper is one of the commodities for the domestic market and non-oil and gas export, which is very potential to be developed. Most pulp papers are required in the artistic field, wrapping pouch, cardboard, and others in various sizes and shapes.

Therefore, santri creativity development effort with

simple technology of pulp paper process in Dayah Ulumuddin, Lhokseumawe is very relevant to be done with partnership pattern (where the Polytechnic through IbM program is responsible for assembling big blender technology and additional equipment, procurement of raw materials and materials Additional materials, and coaching/ counseling, while partner manages pulp-making paper with full responsibility). With the above advantages, small pulp paper manufacturing with raw materials from used paper waste, straw, banana and dried leaves, will have enormous potential to be replicated or exemplified in every dayah others who have a land or situation suitable for the implementation of pulp paper manufacture with a simple technology system. Moreover, many alumni dayah/pesantren that is not independent financially, today, because as long as they live life as students are not equipped with skills to make a living independently. Therefore, pulp paper making technology is needed by partners in increasing income and welfare, for example pulp paper production can be marketed through business unit (shop) Koperasi Dayah Ulumuddin and the others.

2 Method of Implementation

The method of implementing the activities describes the solutions offered to solve the problems that contain the following matters; Identification of problems faced by partners, Justification of partner teams in determining priority issues that must be addressed, approaches to solve partner problems and work procedures to support the realization of the methods offered

3 Deskripsi Result and Discussion

Implementation of community service activity of IbM scheme on business to increase income of santri by applying the technology of pulp paper making and by utilizing waste paper waste, dry straw (dry rice), dried banana trees, and dried leaves in Dayah of Ulumuddin, Uteunkot Village, Muara Dua Sub-district, Lhokseumawe which involving the some santri dayah has been implemented 100% program that is; Socialization and training of pulp paper making and dissemination of pulp paper utilization.

3.1. Identify Problems faced by partners

From the results of identifying the problems that have been described above, it has formed a creative group of santri business in the form of partners by providing facilities in the form of pulp paper technology and equipment. Waste paper pile (Figure 1), dry leaf litter (Figure 2) and large Blender (Figure 3) to disintegrate the waste materials into pulp paper raw materials.



Fig. 1. Pile of waste papers



Fig. 2. Pile of dry leaf litter

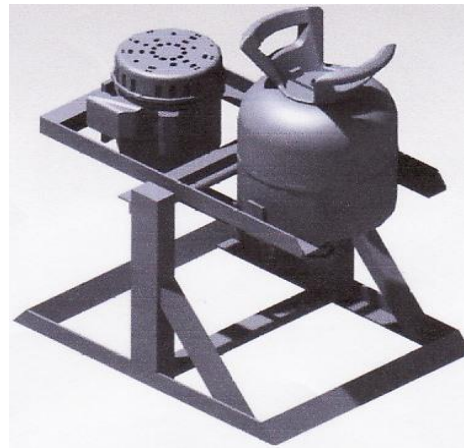


Fig. 3. Big blender as assembled

3.2. Big Blender Assembly

Pulp paper technology requires better raw materials crusher. To that end, the executor of IbM seeks to create and assemble a large Blender suitable for small-scale industrial conditions. This Large Blender Framework is made of St42 steel such as U and L profiles and used steel or tube plates that fit the design dimensions. The overall dimension of this large blender is 60 cm x 45 cm x 45 cm with the diameter and height of each container 26 cm and 28 cm. So the production capacity of slurry is about 5 kg each time the destruction process. The frame shape can be seen in Figure 4.



Fig. 4. Big blender frames (in assembling)

3.3. Pulp Screen Assembly

Pulp screening apparatus is used gauze with 54T mesh and 61T mesh, but they can also be used gauze of steel, copper, and others with certain mesh. The gauze is mounted on a wooden frame as can be shown in Figure 5.



Fig. 5. Pulp screen assembling

3.4. Soaking Process

Before soaking or immersion, the raw materials that have been through the process of chopping and drying. This soaking process serves to soften chemically on the raw materials of waste paper, straw, banana trees and dried leaves. The soaking process is in a container with containing water and accelerated by adding NaOH, Na₂CO₃, Peroxide and or Bayclean as well as meaningful for bleaching of the pulp; And for all mixed materials to be stirred as shown in Fig. 6.



Fig. 6. Stirring the soaked pulp raw materials

3.5. Rough blending

For the destroying pulp raw materials after soaking process is used a big blender (which was assembled earlier). Even, some raw materials are not only subjected to soaking process, but also they have to boiled up to two hours to remove the lignin easily. So that raw material blending can be done effectively. Charging a big blender with pulp can be shown in Figure 7.



Fig. 7. Pouring pulp into big blender

3.6. Smooth Blending

Pulp that has been destroyed with a big blender is usually still relatively rough forms, and then the further process of blending is done again with a small blender, or household-scale blender to obtain a very fine pulp. In addition, the fox glue also needs to be crushed so that the fineness level is equal to the pulp smoothness level. This process can be shown in Figure 8.



Fig. 8. Smoothing with small blender

3.7. Pulp paper printing

Pulp paper and very fine glue fox are mixed perfectly in large aluminum containers with containing water, then the screen is dipped and carefully lifted to equal and the same thickness of pulp above, as shown in Figure 9. Pulp paper filtered sticky by using the screen, then carried still in balance (see Figure 10), and carefully stuck and scrap onto a triplex surface with a cloth on the sloping table, as shown in Figure 11.



Fig. 9. Screening the pulp paper



Fig.10. Lifting the screen of pulp paper



Fig. 11. Adjusting the pulp screen to triplex on a sloping table

3.8. Drying of pulp paper

When the pulp paper is adhered well to the triplex surface, the triplex is brought out for direct drying with sunlight (see Figure 12), or other dryers such as a blow dryer are used for improved drying. To obtain a good pulp paper quality, the drying process should be carried out at a temperature range of 30 - 45 oC with relative humidity ranging from 60 to 80%. Dry pulp paper is a product of this devotion can be made in a variety of interesting colors as can be seen in Figure 13.



Fig. 12. Drying pulp in direct sunlight



Fig. 13. Pulp paper products in some colors

3.9. Business Analysis

Business analysis is an essential activity for sustainable business. The analysis of pulp paper making business varies widely, this is due to the calculation of operational costs depending on the size of the unit of a business, the type of equipment and materials used and access to raw material resources. The analysis of this business is the analysis of pulp paper pulp industry with the following details:

1. The investment of pulp equipment's, raw materials and added materials made of 1 (one) set with the home industry scale as described above without being equipped with a special factory building is estimated to average production capacity of 15 kg per hour pulp paper pulp.
2. If raw materials can be self-cultivated by creative group with defect rate of pulp product about 20%.
3. Pulp Paper is sold in a pulp state at a business location for Rp. 15,000 per kg.
4. The life assumptions of equipment's are three years (3 years x 12 months x 24 days x 8 hours = 6,912 working hours) daily, monthly, and annual maintenance and repair, with a 20% of depreciation rate.
5. The 30% of profit rate with estimated BEP Rp. 7.500 per kg with return of investment period of 0.6 years.

4 Conclusion

Based on this activity can be concluded that: Pulp paper manufacturing in business unit with production capacity of 15 kg per hour and prediction of pulp product defect about 20%. If the selling price of pulp paper products is Rp. 15,000 per kg, assuming maintenance cost and depreciation value of 20%. The profit rate are 30% and BEP Rp. 7.500 / kg of pulp paper, so the return of investment period is estimated at 0.6 years.

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