

Management of Non-Hazardous and Non-Toxic Waste for Corporate Social Responsibility PT. PJB UP Gresik

Moch. Saleh, Eka Setia Budi, Wisrawan Wahju Wibowo, Naindar Afdanny, Totok R. Biyanto

Abstract— Jawa-Bali Power Generation Company, Gresik Generation Unit (PT. PJB UP Gresik) innovated in the development of integrated waste management by establishing waste bank for the community around PT. PJB UP Gresik at Kramat Inggil Village sub district of Gresik. A Preschool named Intan Permata has been funded using income that obtained from waste bank. Parent of students in Intan Permata Preschool pay tuition fees using the own domestical waste by collecting, clasification and store in waste bank storage. This program solve the waste problem and able to provide benefits to the community.

Index Terms— Waste Management, Waste Bank, Corporate Social Responsibility, Preschool.

I. INTRODUCTION

Waste or garbage is a problem on most of all areas in Indonesia. Especially in urban areas, the high rate of population growth will increase on the rate of production of waste [1]. The volume of waste production has increased over time, while the availability of land for establishing landfill is limited [2] as well as the availability of waste processing infrastructure [3]. This resulted the acumulated problem to surrounding communities and planet sustainability. Being green is a matter of responding to the expectations and demands of our world, country, community. PT. PJB UP Gresik has commitment as a Green and Clean Power Plant seeks to maintain environmental sustainability in the areas of power generation units as well as in the area of Gresik municipal [4].

PT. PJB UP Gresik is one of the existing generation units at PJB Company Groups which is engaged in the field of electric power generation business with 2218.78 MW installed capacity, which is based in the town of Gresik, exactly on Harun Tohir streets, Sidorukun Village, Gresik, East Java [5]. The effort have being performed by PT. PJB UP Gresik to solve the problems which are Reduce, Reuse, and Recycle (3R) [6]. The intent of this program is reducing unnecessary waste, reuse the waste for degradable purposes and recycle the waste in the processing plant.

Today, it has been a popular way of tackling the waste problem with waste bank system before it process in 3R . The program is a solid waste collecting management that it is performed by the community itself [7]. This program consist of separation of waste based on the waste type and benefit, send it to collecting area, processing and selling the waste, to improved the benefit of each type of waste and finally it will

provide the economical benefits from this waste [7].

As mentioned before, one of the flagship programs of PT. PJB UP Gresik in a solid non-hazardous and non-toxic waste is 3R, that include the waste processing. Waste processing consist of composting, handcrafting and direct selling to waste collector that will processed it further. The waste bank is located in the Kramat Inggil village. The community in this village have been perform waste processing.

Composting program utilizes a waste resulting in PT. PJB UP Gresik and the surrounding community to produce organic fertilizer [8]. Handcrafting process waste to become plastic flower, vase, pencil case etc.

Unuseful waste will sell to the waste collector to process further. All profit from waste will be used to financed “Intan Permata” preschool, hence the community will provided tuition fee free preschool from waste bank benefit. This paper describes the effort of PT. PJB UP Gresik in managing utilization of waste as well as performing community education.

II. PROCEDURE FOR WASTE BANK PROGRAM

Figure 1 describes a procedure of waste bank from starting to end. In the beginning of the waste bank program is performing the awareness training about the importance of maintaining a clean and healthy environment, as well as the utilization of waste to the 3R program (reduce, reuse, recycle) [4], build an organization structure and management of waste bank program, based on, initiative of community and support from Corporate Social Responsibility of PT. PJB UP Gresik [9].

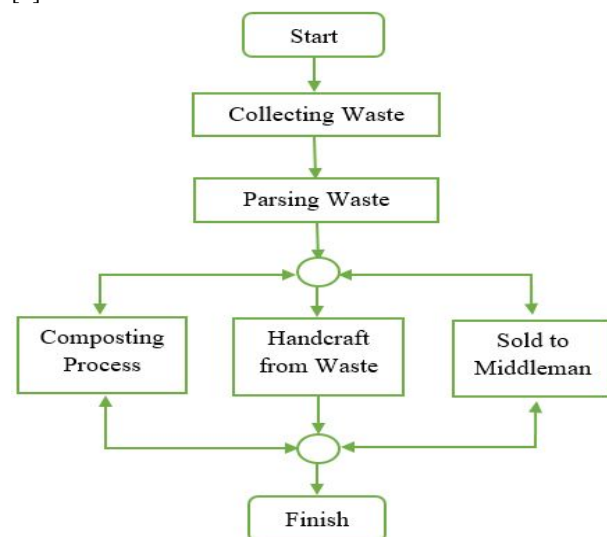


Figure 1. Flowchart of Waste Bank Program

Local community around PT. PJB UP Gresik parse the waste into three category, and collect it to centralized waste processing i.e. composting, handcrafts, and direct selling

Compost material consist of dried leaf, trunk, root that it is decomposed for several days, compost become organic fertilizer, then it is sold in local market.



Figure 2. Utilization of organic waste for compost

Handcraft from waste is made by selecting the waste that can be used as a material for handcraft. The qualified material that use as raw of handcraft is a good condition plastic material, and it can be made a goods such as plastic flower, vase, pencil case etc, as shown in Figure 3.



Figure 3. Handcraft from waste

Metal waste such as iron, steel, aluminum etc, are sold to waste collector. Those waste are gathered from local community and the waste collector will be sold the waste to industries as scrap material.

All profit from waste will be used to financed “Intan Permata” Preschool, therefore, all student can be provide tuition fee free education.

III. BENEFIT FROM WASTE BANK PROGRAM

A. Asset Value

At the first establish PT. PJB UP Gresik provide a grant to the community is about Rp. 22.450.000,-. It was used to purchase tools and additional material to perform the

program. In this time amount of balance is Rp. 14.122.666,-. As mentioned before, all profit from the program is used to financed the Preschool, however the asset of the Waste Bank program increase. It can be concluded this program provide benefit to sustainability of the planet, provide education and job for the people, and as profit generator. The graphical illustration of profit during January – December 2014 is shown in Figure 4. The detail data that described the same purpose are tabulated in Table 1..



Figure 4. Graph of asset value

Table 1. Asset value during January – December 2014

Month (2014)	Value (IDR)
Jan	Rp 14,122,666.00
Feb	Rp 14,050,391.00
Mar	Rp 14,139,166.00
Apr	Rp 14,307,216.00
May	Rp 14,216,765.00
Jun	Rp 14,532,065.00
Jul	Rp 14,967,365.00
August	Rp 15,410,290.00
Sep	Rp 15,743,400.00
Oct	Rp 15,920,250.00
Nov	Rp 15,806,686.00
Dec	Rp 16,398,612.00

B. Activities of Waste Bank program

Typical financial activities in the Waste Bank program is shown in Table 2. Table 2 shows Waste Bank Keramat Inggil has economic and social activities for the community.

Table 2. Activities of Waste Bank

No. Account	Description	(IDR)
	Income	
41000	Loan services	1,735,800.00
42000	Other profit and loan	1,749,650.00
43000	Bank interest	-
44000	Non-operational	182,550.00

	profit	
	TOTAL	3,668,000.00
	Expenses	
51010	The costs of employee incentives	1,805,000.00
51020	Office administration costs	134,500.00
51030	Transportation costs	373,000.00
51040	Cost of meetings and the cost of production	317,000.00
51050	The cost of risk reserve loan	179,979.00
51060	The cost of inventory	
52000	Operational costs	321,350.00
	TOTAL	3,130,829.00

[9] PT. PJB UP Gresik “Laporan CSR PT. PJB UP Gresik.” 2014

Moch. Saleh, Eka Setia Budi, Wisrawan Wahyu Wibowo.
 PT. PJB UP Gresik, Indonesia.

Totok R. Biyanto, Naindar Afdanny
 Process Design, Control and Optimization Lab
 Engineering Physics Dept.
 Industrial Technology Faculty ITS Surabaya 60111
 E-mail : trb@ep.its.ac.id
<http://personal.its.ac.id/dataPersonal.php?userid=trb-ep>

IV. CONCLUSION

Management of non-hazardous and non-toxic waste for corporate social responsibility PT. PJB UP Gresik has been performed successfully. It can be concluded this program provide benefit to sustainability of the planet, provide education and job for the people, and as profit generator.

ACKNOWLEDGMENT

The Authors would like to thank to PT. PJB UP Gresik for providing the facilities in conducting this research.

REFERENCES

- [1] Ngo Kim, and Pham Quoc Long. "Solid waste management associated with the development of 3R initiatives: case study in major urban areas of Vietnam." *Journal of Material Cycles and Waste Management* 13.1 (2011): 25-33.
- [2] Cherubini, Francesco, Silvia Bargigli, and Sergio Ulgiati. "Life cycle assessment (LCA) of waste management strategies: Landfilling, sorting plant and incineration." *Energy* 34.12 (2009): 2116-2123.
- [3] Cherubini, Francesco, Silvia Bargigli, and Sergio Ulgiati. "Life cycle assessment (LCA) of waste management strategies: Landfilling, sorting plant and incineration." *Energy* 34.12 (2009): 2116-2123.
- [4] McDougall, Forbes R., et al. *Integrated solid waste management: a life cycle inventory*. John Wiley & Sons, 2008.
- [5] Ling, Hoe I., et al. "Estimation of municipal solid waste landfill settlement." *Journal of Geotechnical and Geoenvironmental Engineering* 124.1 (1998): 21-28.
- [6] Gadde, Syam, Michael Rabinovich, and Jeff Chase. "Reduce, reuse, recycle: An approach to building large internet caches." *Operating Systems, 1997., The Sixth Workshop on Hot Topics in. IEEE, 1997.*
- [7] Aye, Lu, and E. R. Widjaya. "Environmental and economic analyses of waste disposal options for traditional markets in Indonesia." *Waste Management* 26.10 (2006): 1180-1191.
- [8] Schaub, S. M., and J. J. Leonard. "Composting: An alternative waste management option for food processing industries." *Trends in food science & technology* 7.8 (1996): 263-268.