

PRESERVING THE ENVIRONMENT AND ALLEVIATING POVERTY THROUGH HOUSEHOLD WASTE MANAGEMENT

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Abstract

The household waste disposal problem eventuated from poverty wherein people overly exploited their natural environment, and those who suffered the greatest impacts of from it were always women. Therefore, this research was carried out in order to introduce a way to improve healthy living within households whilst also improving household income by implementing household waste management. The research was carried out from May to October 2010 using an action research method with an in-depth interview stage, and documentation study. Household waste management was implemented using the takakura method and the entrenchment method. The results show that, in Probolinggo, only 4 baskets of takakura successfully produced organic compost, while this method failed completely in Malang and Tulungagung. In Probolinggo, a local public figure's role is very vital in determining the technological adoption of takakura and entrenchment. It was established that this was because the research participants in Malang and Tulungagung were not patient enough in looking after the takakura baskets. The entrenchment method was 100% successful in Probolinggo, and the organic compost, as the outcome of the entrenchment method, has been applied to their cornfields. In Malang the entrenchment method failed because it was difficult to find the household waste and the respondents were not enthusiastic nor motivated enough to participate in the program. The urban society having an increased public economic activity results in the household difficulty in adopting a new method of disposing waste. Tulungagung is a small city having same countryside areas with a dense agricultural activity and adequately available waste disposal area which results in insufficient time for households to change their way of disposing waste. Thus, future programs need awareness and commitment from the citizens to reduce the solid waste pollution of their environment, and there is a clear need to have an environmental cadre who works hard, has high empathy and care to the environment, and communicates well with the citizens; so that the natural resources can be preserved and the poverty within the households can be alleviate.

Keywords: household waste management, environment, poverty

1. INTRODUCTION

Poverty is one of the triggerers of environmental misfortune. (Tribunnews, 2010). It started from poverty, people overly exploited their natural environment. The term *poverty* refers not only to being economically poor, but also poor in knowledge and social life of the particular community. Research findings have proven that those who suffer the greatest impacts of poverty and the consequent poor quality of the natural environment are always women and that women's condition and their health are poorer than that of men. Therefore, empowerment programs for healthy living within poor household communities should be introduced, and one potential empowerment program is to give them basic training in household waste management. It has been estimated that 2.69 liters of waste are produced per person in an average household (Zuhriyah, 2010). It has been demonstrated that this waste can be processed to

produce organic compost. This organic compost can be used to increase the household income as well as to improve their economic level. Ridho Task (2012) stated that a village in Cilandak has processed its waste and was able to earn some money from it.

The objectives of this research are to identify the hopes of poor communities towards the natural environment around them, to identify the attitude of poor communities towards waste management, to apply two models of household waste management, and to evaluate the implementation of waste management and the attitude of poor communities who have received the waste management's training. In the event that the implementation and the transfer of waste treatment method is successfully accepted by society, it will be expected that it will have a positive impact on not only household income of the communities but also can teach the communities to start healthy living by looking after their surrounding natural environment.

2. METHODOLOGY

The research program was done in three cities in East Java Province; Malang, Tulungagung and Probolinggo. The research program was carried out from May to October 2010. As the main respondent of this research is household women in the poorest community from those cities, thirty women were chosen by random sampling to become the research target and be given training in household waste management. The secondary target as the informant of this research is the village officials, community leaders, and health department. They were influential stakeholders in the sense that they are able to motivate, make policies and decision making. The study was conducted using action research methods which consist of in-depth interviews, and documentation study.

The training in waste management was done in three steps;

Firstly, the participants were given brief knowledge, in which the method used in counselling was partisipative, including discussion and lecturing. The time devoted was 2 days with 2 times meeting, regarding environmental pollution, impacts to the health and composting process;

Secondly, the targeted participants were divided into 3 groups, each group consisting of 10 participants;

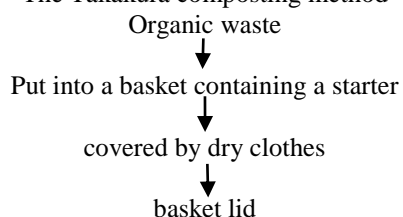
Third, the training of composting process was given for the *takakura* and *entrenchment* methods. A training method was done to carry out a direct demonstration regarding a composting process to trainees, then was followed by a supervising activity for 3 months to get to know the success rate.

The *takakura* composting method consists of:

1. the fresh organic waste is cut into small pieces and put into takakura basket;
2. place a chaff cushion on top of it;
3. make sure that the mixture of the compost is not too dry or too wet, it should be given small amount of water if it is too dry and should be puddled if it is too wet.
4. after two months the compost can be harvested and sifted around;
5. the compost can be applied as fertiliser, retaining a small amount as a starter for the next composting batch.

Moreover, the formation in the *takakura* basket is the chaff covered with dry clothes as the base, fresh organic household waste mixes with a starter, a chaff cushion and the lid as the top of the basket.

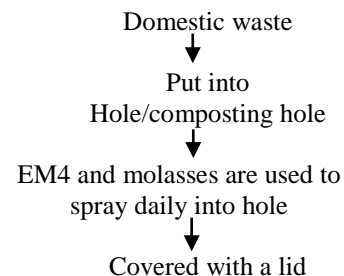
The Takakura composting method



The entrenchment composting consists of:

1. an entrenchment hole is dug, 2 meters in length, 1.5 meters in width, and 1 meter in depth;
2. cut 2 hard pipes. Two Piralon pipes 4 diameter with 6 m in length, and shape them into a 'U', 1.5 meters high and 1.5 meters long, and place them into the hole;
3. make a cover from plastic material. A plastic slice to cover hole to prevent from rain with 2 meter long, a roof-like.
4. place organic waste that come from the household or the backyard into the hole;
5. spray the waste with EM4 liquids. EM 4, is a mixed culture made from microorganism containing lactobacillus. It is capable of increasing waa, costing Rp. 18.000/liter and molasses;
6. additional waste can be placed into the hole anytime any day, however, EM4 liquid and molasses should also be sprayed in all time. Organic compost can be daily placed into it as long as it is not yet full. EM4 and molasses which water already add are sprayed daily into the hole to retain moisture, resulting in a better composting. It takes 21 – 30 days for the entrenchment process to convert organic waste into organic compost. If the hole is completely filled with the waste, 250kgs of compost will be produced.

The Entrenchment method



3. RESULTS AND DISCUSSION

3.1. Respondent characteristics

The age of respondents were between 20 to 60 years old, while the limitation of productive age according to the Indonesian demography were between 15 to 64 years old. The majority of the respondents stated their occupations as housewives, labourers in private companies, and farmers respectively. The education level shows that the majority of the respondents in Probolinggo were only finished their education at the primary level, while Tulungagung and Malang were at the high school level.

Fig. 1. Respondent Characteristics in Probolinggo, Malang, and Tulungagung.

No	Characteristics	Probo-linggo (%)	Malang (%)	Tulung-agung (%)
1.	Age (yr) < 20 20-30 31-40 41-50 51-60	1(3) 11(38) 12(42) 3(10) 2(7)	- 1(8) 4(31) 6(46) 2(15)	- 4(12) 16(49) 11(33) 2(6)
2.	Occupation : a. farmers b. entrepreneur c. civil servant d. labours e. housewives	7(24) 3(10) 1(4) - 18(62)	- 2(15) - 1(8) 10(77)	4(12) 2(6) - 12(37) 14(42)
3.	Education : Primary Junior high Senior high Undergraduate	15(52) 7(24) 6(46) 1(3)	1(8) 4(31) 6(46) 2(15)	6(18) 10(30) 16(49) 1(3)

3.2. Household Waste Management

The majority of the respondents discarded the garbage from their household to the river, public bins, backyards or by burning. Especially in Tulungagung and Probolinggo, it was quite common for the respondents to discard their household waste into their own backyard as at these two cities, every household still has wide backyard compared to those living in crowded cities such as Malang. The worst finding was that most of the respondents in these 3 cities discarded their detergent waste to the yard and septic tanks. This resulted in died decomposing bacteria while the thrown away detergent causes land pollution.

No	Dumping Tip	Probo-linggo	Malang	Tulung-agung
1.	Kitchen waste (%) a. bins b. river c. yard	9(30) 1(4) 19(66)	12(92) - 1(8)	19(58) - 14(42)
2.	Backyard waste (%) a. bins b. river c. burnt d. amassed	3(10) - 26(90) -	5(38) 1(8) 3(23) 4(31)	11(33) - 14(42) 8(25)
3.	Detergent waste (%) a. septic tank b. river c. yard d. bathroom sanitation	13(45) - 11(38) 5(17)	5(38) 2(16) 1(8) 5(38)	18(56) - 13(39) 2(5)

Fig.2. The Dumping Tips of Kitchen Waste, Backyard Waste and Detergent Waste.

3.3. Knowledge of Respondents Towards Organic and Non-organic Wastes

It is evident that improved knowledge of effective household waste management by rural households is very much needed in order to preserve the environment. In Probolinggo area, around 52% of the respondents stated that they did not know the difference between organic and non-organic wastes, while 38% of the respondents in Malang stated that they had heard these terms but they did not understand the meanings. Meanwhile, 55% of respondents in Tulungagung stated that they only knew a little bit about those two terms.

No	Rural Knowledge about the waste	Probo-linggo	Malang	Tulung-agung
1.	Does not know	15(52)	1(8)	-
2.	Heard once before	8(28)	3(23)	2(6)
3.	Only knew a little bit	3(10)	2(15)	18(55)
4.	Familiar but do not understand	3(10)	5(38)	10(30)
5.	Familiar and understood	-	2(15)	3(9)

Fig.3. Respondents Knowledge Towards Organic and Non-organic Wastes

In light of this finding it was not surprising that most of the respondents did not separate the wastes according to its specimen.

No	Separation	Probo-linggo	Malang	Tulung-agung
1.	Never	16(55)	6(46)	12(37)
2.	Rare	5(17)	1(8)	4(12)
3.	Sometimes	6(21)	3(23)	11(33)
4.	Often	2(7)	3(23)	-
5.	Always	-	-	6(18)

Fig.4. Waste Separation Before Discarded

4. CONCLUSION

- 1) The percentage of household waste which was discarded to the bins in Malang and Tulungagung is about 92% and 58%. Meanwhile in Probolinggo, most of the respondents discarded the waste to their backyard or to the nearby river. The next most common treatment for this waste is by burning it. Probolinggo shows the highest percentage for this case, which is 90%, while Malang and Tulungagung are 23% and 42%, respectively. Detergent waste was usually being discarded to either septic tank, backyard or to the sewage.
- 2) The knowledge of the respondents about organic and non-organic wastes show that 52% respondents in Probolinggo do not have the knowledge of it, while in Malang

and Tuluagung are 38% and 55%, respectively have very little knowledge of it. Around 55% and 46% of the respondents in Probolinggo and Malang never separate their household waste into two type of wastes, organic and non-organic.

- 3) The vocational education was given to the respondents, it which was about pollution towards the environment and its impacts, wastes and its impacts towards human health, and the implementation of waste management using *takakura* and *entrenchment* methods. The result shows that only 4 baskets of *takakura* were well adapted in Probolinggo, and failed for all other cities. This is because the two cities which were Malang and Tulungagung were not patient enough in looking after the *takakura* baskets. There were 2 respondents from Probolinggo having been succesfully harvesting *takakura* compost which were used for fertilizing cincau plants while in Malang and Tulungagung, a basket has switched its function into trunk. Meanwhile, the *entrenchment* method in Probolinggo was 100% success and the organic compost as the outcome of this method has already been applied as fertilizers for their cornfields. In Malang both methods failed, this is because it was difficult to find the household waste, the respondents were not enthusiastic and not motivated enough to participate in this research.
- 4) This Research recommends that. It needs awareness and commitment from the citizens to reduce the pollution of our environment, and the need of having

environmental cadre who works hard, has high empathy and cares to the environment, also has good communication with the citizens; so that the natural resources can be preserved and the poverty within the households can be aalleviated.

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