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Utilization Of Household Organic Waste Into Solid/Liquid Compost And Tongue-In-Law Rope Fiber

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Abstract. Household waste is often ignored and thrown away, even though waste can be utilized if managed as solid/water bokashi fertilizer and snake plant fiber. The purpose of community service is waste sorting, training activities for processing solid and liquid compost fertilizers using the solid and liquid bokashi method, and making raw materials for snake plant fiber crafts using the braiding method. The results of the activity were that the socialization participants were very enthusiastic about participating in the activity, especially after being given education through the provision of materials, distributing leaflets on making solid bokashi fertilizer and liquid organic fertilizer. The focus of the activity was on household waste management, so that residents of RT. 41 waste were able to independently manage and utilize snake plant leaves. The utilization of organic waste and the remains of pruning lush snake plant leaves can be processed into solid compost and liquid compost as well as snake plant fiber rope. The economic value of solid compost fertilizer is IDR 1,300.00 / kg, liquid fertilizer IDR 0 / L, and snake plant fiber rope is IDR 5,208.33 per 50 m.

Keywords: *Solid, Liquid and Snake Plant Leaf Compost Fertilizer.*

INTRODUCTION

Waste from households, markets, stalls, offices, and factories can consist of solids, liquids, and gases. Household waste is often neglected and simply discarded, which can have a negative impact on the environment. However, if managed properly, it can be utilized as animal feed or fertilizer. Fertilizer produced from organic materials contains nutrients needed by plants. Long-term use does not damage the soil and is environmentally friendly, making it safe for use on plants. Household waste comprises 75% organic waste, with the remainder being inorganic waste (1). Organic waste generated from household activities includes food scraps, vegetable scraps, fruit scraps, rice washing water, and other food waste. This waste can be processed into animal feed and organic fertilizer, both solid and liquid, which can be used directly on plants around the home. In addition to organic waste from households, which includes food scraps, greens or pruning waste from perennials and flowers, including twigs, banana stems, pineapple stems, leaves and flower stalks, and snake plant leaves. The remains from pruning snake plant leaves can actually be processed into handicrafts that have economic value and generate profit. Every household in RT 41 also has a yard that produces this organic waste. The Thematic Community Service Program (KKN-T) aims to apply the theories learned to the community. This program aims to implement community service by educating the community, particularly residents of RT 41, about the use of organic waste as solid and liquid compost and the processing of other organic materials into raw materials for handicrafts, including those from the pruning of snake plant leaves. It is hoped that this educational activity will increase residents' knowledge and skills in reducing waste volume and utilizing organic waste.

RESEARCH METHODS

This community service program was implemented for one month, from June to July 2025. Participants were residents of RT 41 RW 08, Betungan Village, Selebar District, Bengkulu City. The location of the community service was Jalan Air Manna 3, RT 41. The method used in this activity consisted of two activities:

- 1) educational activities through waste sorting outreach,
- 2) training activities on processing solid and liquid compost using the solid and liquid bokashi method, and making raw materials for snake tongue fiber crafts using the braiding method.

The tools and materials used in processing the solid compost are shown in Table 1.

Table 1. Tools and Material

Tool	Material
Bag	EM4
Knife	Wet Greens
Gloves	Bran
	Kohe
	Husk
	Sugar

Bokashi is a type of fertilizer that can replace artificial chemical fertilizers to increase soil fertility and repair damaged soil properties caused by excessive use of inorganic (chemical) fertilizers (Tufaila et al. 2014). Liquid organic fertilizer is a solution resulting from the decomposition of organic materials from plant residues, animal waste, and human waste, containing more than one nutrient. Completion of composting can be determined by observing its physical condition, with successful fermentation indicated by the presence of white spots on the surface of the liquid. The resulting liquid will be brownish-yellow with a pungent odor (Purwendro and Nurhidayat, 2007). The tools and materials needed to make liquid organic fertilizer from organic waste are as follows:

Table 2. Tools and Materials

Tool	Material
Gallon	Organic Waste
Knife	Rind
	Land
	Dried leaves
	Rice Washing Water

The most common use of snake plant is as an ornamental plant, but in fact, this plant has other benefits that are still not widely known. Snake plant has the ability to absorb pollutant gases (dangerous air gases) (Rosha, et al., 2013). In addition, the leaves of this plant contain natural fibers that have the same characteristics as pineapple leaf fibers. These characteristics are not easily brittle, shiny, and long (Imani, et al., 2015). Snake plant leaves contain quite high chemical components of cellulose and lignin (Suryanto, et al., 2014). The tools and materials needed to make rope fiber from snake plant leaves are as follows:

Table 3. Tools and Materials

Tool	Material
Spoon	Aloe Leaf
Knife	Dye
Pruning Shears	

RESULTS AND DISCUSSION

Socialization of 3R Waste Sorting, Especially Organic Waste

Group 02, participating in Community Service Program (KKN-T) in RT.41 RW.08, Betungan Village, managed waste in a more environmentally friendly manner through three main steps: reduce, reuse, and recycle. Each step has a different purpose and method for reducing the negative impact on the surrounding environment. Therefore, we implemented 3R waste processing, which has economic value.

Distributing leaflets to facilitate information dissemination

Group 02, participating in Community Service Program (KKN-T) in RT 41 RW 08, Betungan sub-district, distributed leaflets to facilitate the dissemination of information on organic waste processing to residents, enabling them to process organic waste from their kitchens independently. The leaflets distributed to residents can be seen in Figure 2.



Figure 1. Information Leaflet On Organic Waste Processing

Providing information on the value of organic waste processing

The economic value of products from waste processing involves various methods and factors, ranging from analyzing the potential of a circular waste economy to calculating the costs and benefits of processing waste into valuable products. The information provided is the cost of goods produced (COGS) from organic waste processing. The economic value of organic waste processing is as follows:

Solid compost/solid bokashi:

Table 4. Calculation of HPP of solid compost/solid bokashi fertilizer

No	Description	Unit	Contents(g)/(m)	Price (Rp)	Needs (g)/(m)	Amount (Rp)
1.	Bag	pcs	1	2,000	4	8,000
2.	EM4	bottle	1000	32,000	100	3,200
3.	Husk	kg	50000	20,000	10000	4,000
4.	Greens	kg	4000	0	4000	0
5.	Kohe	kg	1000	0	6000	0
6.	Bran	kg	1000	4,000	4000	16,000
Total						31,200

Source: Data Processing, 2025

From the calculations in Table 4, the HPP for solid compost/bokashi is Rp. 31,200.00 per 24 kg, or Rp. 7,550.00/kg.

Liquid Compost

Table 5. Calculation of HPP of liquid compost/liquid bokashi fertilizer

No	Description	Unit	Contents(g)/(m)	Price (Rp)	Needs (g)/(m)	Amount (Rp)
1.	Skin Fruit	kg	0	0	500g	0
2.	Rice Washing Water	liter	0	0	1 Liter	0
3.	Gallon	pcs	0	0	2	0
4.	Leaf	kg	0	0	500g	0
5.	Rubbish Organic	kg	0	0	1 Kg	0
Total						0

Mother-In-Law's Tongue Fiber

Table 6. Calculation of HPP of snake tongue fiber

No	Description	Unit	Contents(g)/(m)	Price (Rp)	Needs (g)/(m)	Amount (Rp)
1.	Aloe Leaf Parents in law	Sheet	0	0	64 sheets	0
2.	Dye	Bottle	30	5,000	2	333
3.	Fox Glue	ml	150	15,000	30	3,000
Total						3,333

The results of 64 leaves of snake plant produce 32 meters of rope fiber which costs Rp. 3,333.00 so that each meter is sold at a price of Rp. 104.00/m. If the hemp rope sold on the market is Rp. 15,000.00 per 50m while the snake plant rope fiber costs Rp. 5,208.33 per 50m. This means that the price of rope fiber from the snake plant is cheaper when compared to the hemp rope sold on the market.

Training on Processing Organic Waste into Solid/Liquid Compost and Snake Plant Fiber

Compost is organic material that has undergone a decomposition process with the help of living organisms such as microorganisms and worms. Compost contains various nutrients that are very beneficial for the soil. Compost functions as a conditioner, fertilizer, source of humus, and natural pesticide for the soil, which can aid plant growth when used as a planting medium (Mardwita, Yusmartin, Melani, Atikah, & Ariani, 2019). Compost is an organic fertilizer that is highly beneficial for increasing agricultural production, both in quality and quantity, reducing environmental pollution, and sustainably improving land quality (Amiruddin & Adam, 2018). Long-term use of compost can increase land productivity and prevent land degradation, as well as play a significant role in improving soil physically, chemically, biologically, and environmentally. Compost production requires raw materials in the form of organic material, decomposing organisms, and appropriate moisture (Sahwan, Wahyono, & Suryanto, 2016).

Several methods for compost production include the Takakura method and the bokashi method. The Takakura method has the main characteristic of maximizing the natural degradation process of organic waste into fine compost. In composting methods, there are several methods, including the Bokashi method and the Takakura method, compost seeds are made from fermented foods available around us and other materials that are cheap and/or easy to obtain (Kohei, et al., 2020). Meanwhile, the bokashi method is a technique for making organic fertilizer that can be made yourself from a mixture of several fermented materials from organic materials such as straw, husks, rice bran, corn bran, wheat bran, rice husks, tofu dregs, coconut dregs, recycled waste, grass and animal waste (Hardianto 2008). Augustien stated that vegetable waste from tea compost contains 0.1% Nitrogen, 0.0035% Phosphorus, and 0.17% Potassium at a dose of 1.5 EmS/cm (1,050 ppm) (Latifah et al., 2012; Nora, 2006). Meanwhile, research conducted by Latifah et al. stated that the results of the liquid organic fertilizer content after 14 days found a Nitrogen content of 0.16%, Phosphorus 0.014% and Potassium content of 0.25% (Latifah et al., 2012). In this community service project, the process for making compost using the Bokashi method is as follows:

1. Chop wet waste into 3-5 cm pieces.
2. Mix the wet waste, manure, and bran thoroughly.
3. Dissolve EM4 and sugar water in 200 liters of water.
4. Pour the solution slowly and evenly into the wet manure-and-bran mixture. Stir until the moisture content reaches 30-40%. This will indicate that the mixture does not fall apart when opened.
5. Spread the mixture 15-20 cm thick on the floor and cover with a sack or tarp for 5-7 days.
6. Stir the mixture daily to maintain a temperature of 45-50°C.
7. After 1 week, the solid Bokashi fertilizer is ready to use.



Figure 2. Training on Turning Organic Waste into Solid Bokashi

Liquid organic fertilizer is an extract from the decomposition of organic materials. These organic materials can come from plant residues, animal waste, and human waste, which contain more than one nutrient (Ardiyanto, Wawan, 2018). Extracting organic waste allows for the extraction of all the nutrients contained within the organic waste. In addition to nutrients, it also absorbs microorganisms, bacteria, fungi, protozoa, and nematodes. Liquid organic fertilizer contains potassium, which plays a role in every plant metabolic process, including the synthesis of amino acids and proteins from ammonium ions. It also plays a role in maintaining turgor pressure, enabling smooth metabolic processes and ensuring continuous cell elongation. The process for making liquid organic fertilizer using the Bokashi method is as follows:

1. Prepare organic waste—fruit peels, leaves, and rice washing water.
2. Prepare a gallon jug to hold the waste and leachate.
3. Ferment for 7-14 days until all the waste in the gallon has decomposed.
4. After 1-2 weeks, the leachate is ready to be dried.
5. Dry the leachate in the sun until it turns red-brown.
6. After drying, the red/brown leachate is ready to use.

The training activities for making solid Bokashi fertilizer carried out in RT 41 were carried out through direct practice as shown in Figure 3



Figure 3. Utilization of Organic Waste as Liquid Organic Fertilizer

Snake leaves contain high levels of cellulose and lignin (Suryanto et al., 2014). Therefore, snake plants can be used as an alternative natural fiber in household and industrial activities. Benefits of snake fiber include: rope and craft materials, an environmentally friendly alternative, and textile and composite materials. The method for making snake fiber rope is as follows:

1. Prepare the pruned snake leaves.
2. Pound the snake leaves, occasionally adding water to facilitate shaving.
3. Shave the regrown snake leaves until the surface is thin.
4. Place the shaved snake leaves in water with dye and boil.
5. Remove the shaved snake leaves from the boiling water and dry in the sun for 15-25 minutes.
6. Weave the dried snake tongue fibers like weaving goat rope.

The activity of making mother-in-law's tongue rope fiber in RT. 41 was carried out during a training activity on June 29, 2025, with residents who attended the activity, especially housewives in RT 41 and teenagers. The training activity for making mother-in-law's tongue rope fiber carried out in RT 41 was carried out through direct practice as shown in figures 7, 8, 9, and 10.



Figure 4. Training in making fiber rope



Figure 5. Rope Weaving Training

CONCLUSION

Organic waste and the remaining pruning of lush snake plant leaves can be processed into solid and liquid compost, as well as snake plant fiber rope. The economic value of solid compost is Rp. 1,300.00/kg, liquid fertilizer Rp. 0/L, and snake plant fiber rope Rp. 5,208.33 per 50 m.

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