

Original Article

***PROSES (Waste Alms Program) As an Alternative Innovation for Household Waste Management***

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***ABSTRACT***

Bengkulu Province annual waste accumulation reaches 38,417.16 tons/year, and the volume of waste in Bengkulu City is increasing every day. The total waste entering the Landfills is 648.85 M3, and the condition of the TPA which has been operating for 32 years is expected to decline over the next year. Careless waste disposal will cause water to clog, which further leads to flood. Based on the 2020 Indonesian Disaster Risk Index, Bengkulu province is at the second highest risk for flood after West Sulawesi. This condition will even get worse if the water flow is blocked by waste. Simple action can turn waste into useful objects through waste donation. This study aims to implement waste donation program as an alternative innovation in managing household waste. This was a community-based study with a cross-sectional research design carried out in June and July 2023. The population involved family households in Bengkulu City in 2021. The study samples were selected using a simple random sampling technique which found 542 households. This study has obtained a certificate of ethical approval from the Bengkulu Health Polytechnic Number No. KEPK.BKL/416/06/2023 dated June 30, 2023. Data were analyzed through univariate analysis and analysis of interview results. Most households in Bengkulu City were aged 29-58 years, married, had less than a high school education, unemployed, and had poor levels of knowledge, attitude, and behavior regarding household waste management. There is a need for commitment from the Environmental Service, District, Village, Head of Neighborhood Units (RT), LPM and Community Figures regarding the implementation of the Waste donation Program. The support of the smallest community unit, namely the Chairman of the Neighborhood Unit, is the key to the success of household waste management among households, especially in sorting organic and inorganic waste. Such practice will help make the waste donation program a success. Waste donation can be an alternative for households in worship and also help reduce the accumulation of waste in Landfills. It is recommended cooperation between the Village Community Empowerment Institution and the Waste Bank in providing routine assistance to the Waste donation Program.

**Keywords:** *Management, Waste, Donation, PROSES*

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**INTRODUCTION**

Waste is the residual of human activities in solid and liquid states, both in the form of organic and inorganic substances that

can or cannot be decomposed and are considered no longer useful, so they are simply thrown into the environment. Waste can also be interpreted as unwanted material after processing and use (Hutagalung, 2021). Waste is generated every day by households, both

organic and inorganic waste. There is still a lot of waste that is deliberately thrown out of place, even on the side of the main road, resulting in a pile of waste which has an impact on damage to the surrounding environment (Yuwana, 2021). The environment becomes slums and dirty. Waste also causes flooding during the rainy season and can easily catch fire during the dry season which causes environmental pollution and disrupts settlements.<sup>1</sup>

Organic waste can be said to be environmentally friendly waste and can even be reprocessed into something useful if managed properly. 70% of waste thrown at Landfills is organic waste. Organic waste in landfills causes unpleasant odors in the environment, reduces plastic recycling rates, and poses a risk of landfill explosions.<sup>2</sup> There have been many innovations in waste management methods, including the application of the 3-R, 4-R, or 5-R principles and the method of applying biopore holes. 3-R method is the concept of waste management by Reducing, Reusing, and Recycling. 4-R method is 3-R method plus Replace starting from the source. Furthermore, 5-R method is 4-R method plus Replanting. 4-R waste management is very important to implement in the context of efficient and effective urban solid waste management, so that it is expected to reduce waste management costs.<sup>3</sup> An example of inorganic waste usage is making plastic sachets for coffee and tea packaging combined with plastic bottles into handicrafts that have economic value. Community is the target unit as the subject or the center of social change as well as creating and controlling such change (Siswati, et al, 2022).

Bengkulu Province annual waste accumulation reaches 38,417.16 tons/year. An innovation previously performed by the Bengkulu City Government was "Merdeka Sampah Bisa 2022" by issuing a Circular Letter of the Mayor of Bengkulu No: 660/87/DLH/2021 concerning Environmental Cleanliness which involves the Heads of Regional Apparatus Organizations, Sub-districts and Villages to appeal and socialize it to all Neighborhood Units, community figures, Community Empowerment Institutions as well as the community to maintain environmental cleanliness. The work programs involved the provision of waste banks, 34 containers placement in several areas of Bengkulu City, and sub-district level cleanliness competitions.

Regional Regulation Number 12 of 2011 concerning Waste Processing requires every household to provide organic and inorganic waste closed containers (sorting) to be placed and transported by officers.

Household waste management should start from the source, namely the household. Every household needs to manage their waste both individually and as a group in their respective living environments. Community-based waste management uses the 5M concept, namely reducing waste, sorting waste, utilizing waste, recycling waste and saving waste. In light of environmental aspect, the benefits of the 5M waste management system are reducing the amount of waste to be disposed of in landfills, helping to reduce air pollution due to burning waste, and helping to create a healthy and clean environment.<sup>4</sup> Changing the behavior of city residents is the key to solving the city's waste management problem. Nothing can be done if they are not aware of the harm due to their actions. The result of previous study showed that if the city government intended to reduce the volume of solid waste at the source, it would be better to provide training to women on waste management. When women manage household waste, there was an increase in waste sorting about 9% compared to providing training to men on waste management (with a mean sorting rate of 65%). Such finding indicated that women tended to throw away more than men, which contributed around 80% of total household waste.<sup>5</sup>

Inadequate optimization of waste management causes various environmental problems, namely poor environmental sanitation, the emergence of disease due to flood, piles of waste, the organic content of agricultural land decreasing as a result of the use of chemicals, as well as the impact of global warming due to waste burning (Yuwana, 2021). We can turn waste into powerful objects to provide benefits through simple actions. One of beneficial movements is waste donation. Donation is a form of worship that is highly recommended, because donation is a means of achieving blessings. Donation does not have to involve luxury goods. Unused objects, household waste, especially inorganic waste, can be used as donations. The advantage of donation is that it creates awareness and care for the environment. By not throwing away non-decomposable waste, we are helping to keep the environment clean. Maintaining environmental

sustainability is a form of awareness, concern, responsibility and gratitude for the blessings of Allah SWT. Waste donation is a social movement that aims to reduce the volume of waste. This activity is expected to be able to move community members to care more about their environment. Through the waste donation movement, the community can, in addition to performing waste management, be able to do alms by donating their waste through waste donation groups. The waste donation program is a solution for community-based waste management through a health and religious approach.<sup>6</sup>

Biopore has the function of processing biodegradable waste. Biodegradable waste is put into the hole to empower underground decomposers (such as worms and microorganisms). Furthermore, the worms will form pores in the soil, or so called biopores, to accelerate the creation of water absorption and provide oxygen in the biopore holes. Moreover, Biopore Holes can help reduce the city's vulnerability to floods, drought due to lack of water sources and help reduce the burden of organic waste.<sup>7</sup> Heat is very important in fast composting, the high temperature at the start of the composting process is caused by the activity of microorganisms which are degrading organic material. Microorganisms release heat energy which is a product of the carbonation process. Microorganisms in compost material actively decompose organic material into ammonia, carbon dioxide, water vapor and heat through a metabolic system with the help of oxygen. As the days go by, the temperature of the mound gradually decreases until it reaches normal temperature and will return to being like soil, this can happen due to the large amount of organic material in the compost material in the natural phase of composting.<sup>8</sup>

Two kinds of policies are needed; (i) awareness raising policy and (ii) economic incentives policy. Such economic incentives will be replaced with alms or donation. At every level of the city system for waste management, creativity and innovation are aimed at encouraging behavioral changes in society.<sup>9</sup> This waste donation is part of an alternative in waste management. This innovation method is simple to implement since it does not require human resources with certain potentials, simply by sorting the waste according to its type, then collecting it to the head of the neighborhood unit, then delivering it over to the collector or

via an online application. Income from the sale of inorganic waste are handed back to the head of the neighborhood unit to be used as cash, operations and alms for poor residents or who those have BPJS Health arrears. Waste donation should not differentiate between rich and poor people to do it because it can be done anywhere, anytime and by anyone. However, in reality it is not widely done because it is not so visible as an act of alms. For this reason, the current study aims to implement waste donation program as an alternative innovation in managing household waste in Bengkulu City. Waste donation starts from the household as an alternative to problems in managing household waste.

## RESULTS

This was a community-based study that applied a collaborative approach. The study involved researchers along with all stakeholders, namely the community, in a balanced manner throughout the study process (Susilawaty, 2016). Cross sectional design with primary data analysis as a quantitative study was conducted in June and July 2023.

The population involved family households in Bengkulu City in 2021m with a total number of 109,975. The study samples were selected using a simple random sampling technique which found 542 households who met the inclusion and exclusion criteria. The independent variables in this study were age, marital status, education, employment status, knowledge, attitude and behavior in managing household waste. The dependent variables in this study were community participation with indicators of contribution in household waste management, community support, commitment, cooperation and expertise of environmental cadres and RT heads collaborated with the Bengkulu City Environmental Service. The qualitative informants were the RT Heads and Environmental Cadres in Bengkulu City. This study has obtained a certificate of ethical approval from the Bengkulu Health Polytechnic Number No. KEPK.BKL/416/06/2023 dated June 30, 2023. Data that had been collected were further processed through the stages of editing (rechecking the collected data), coding (simplifying data in the form of numeric codes or symbols), and tabulation (organizing data through tables). Furthermore, the data were

analyzed univariately (frequency distribution analysis). The results of quantitative data analysis were analyzed qualitatively through

the stages of reduction, display, matrix and conclusion as the final outcome.

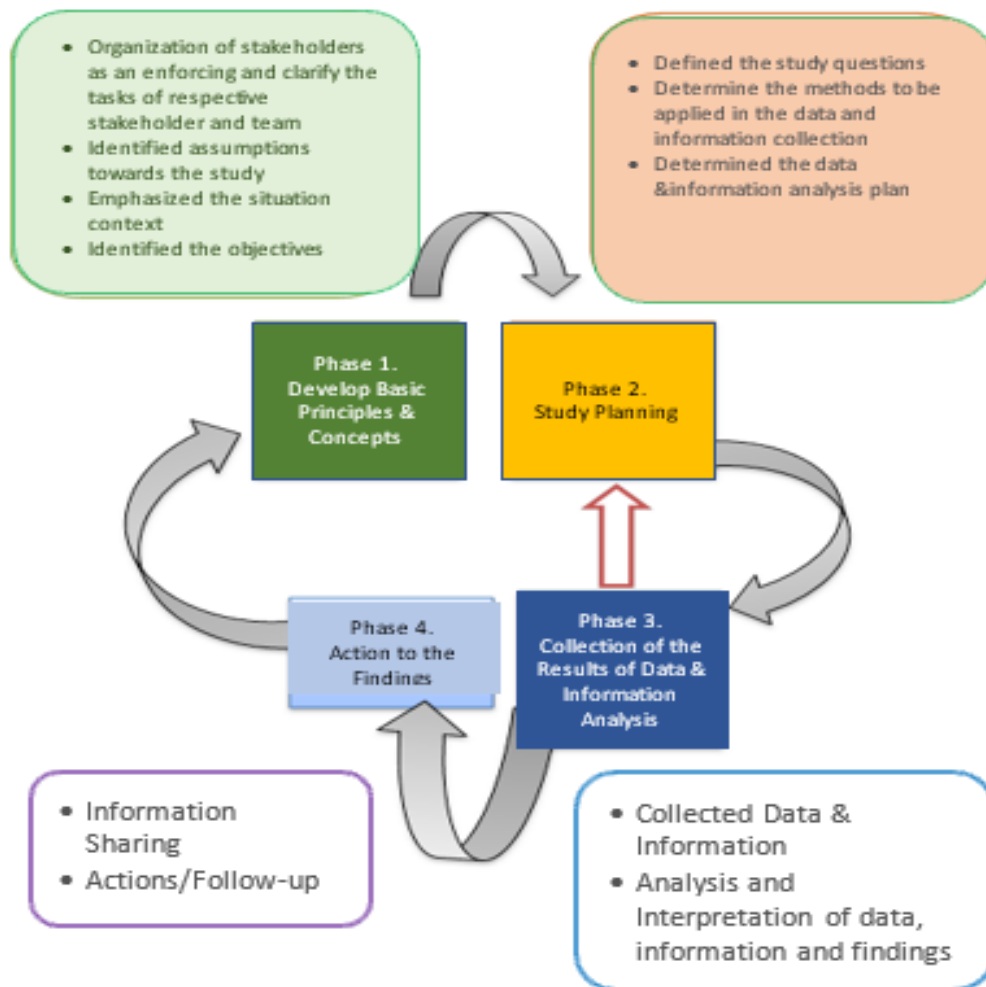


Figure 1. Study Flow

## RESULTS

Table 1. Characteristics of Respondents

Characteristic	N	%
Gender		
Male	86	15.9
Female	456	84.1
Age (years)		
19-28	85	15.7
29 - 38	107	19.7
39 - 48	142	26.2
49 - 58	106	19.6
59 – 68	79	14.6
69 – 78	22	4.1
79 – 88	1	2
Marital Status		
Unmarried	47	8.7
Married	481	88.7

Divorce	14	2.6
Education		
≤ SHS	409	75.5
Undergraduate - Graduate	133	24.5
Employment Status		
Employed	120	22.1
Unemployed	422	77.9
Availability of Dustbin		
Available	542	100
Waste Disposal Condition		
Closed	542	100
Waste Disposal Location		
Outside the House	542	100
Waste Sorting		
No	542	100
Daily Waste Disposal		
No	542	100
Waste are thrown in Landfill		
Yes	542	100
Processing of Used Goods		
Yes	542	100
Bring Own Bag when Shopping		
Tidak	542	100
Buy Packaged Materials		
Yes	542	100
Waste are Used for Animal Feed		
Yes	542	100

Source: Study Findings, 2023

The results of frequency distribution analysis in this study can be seen in table 1 above. Most of respondents were female (84.1%). 409 people (75.5%) were graduated from Undergraduate or Graduate Degree, 422 people (77.9%) were unemployed. Furthermore, most of them were married as many as 481 people (88.7%). All households had closed rubbish bins located outside the house and performed daily waste disposal into temporary dustbin. Households did not separate organic and inorganic waste, did not bring own bag when shopping, and often bought packaged materials. However, household food waste was used as animal feed.

Based on the results of interviews with the RT Heads regarding household waste management it was found that monthly payment in the sub-district was IDR 25,000 to RIDR 30,000, which was deposited to be paid to NGOs. One of the residents' houses already had a 40 liter barrel, so the residents could put the organic waste in the large barrel to make organic fertilizer. According to the results of interview with the RT Heads, it was revealed that the waste to be donated existed. Previously the

residents had independently made organic trash cans, because it was a donation from Perban Nusa. It is a kind of NGO related to waste, so they were actively proactive in waste management. They worked together with the community. There was a 40 liter barrel available in front of the house of Mrs. Titi for local residents if they wanted to donate their organic waste. The community made the sale of handicrafts made of Ale-Ale tea glasses. Furthermore, Le Minerale Bottles were turned into tissue holders, and Aqua bottle were turned into hats. Thank God, we sold them to other women. The plastic hats was sold for IDR 50,000.

It was very difficult to sort waste between organic and inorganic waste. People tended to put organic and inorganic waste together in one plastic, then just threw it into the trash can to be transported it to the landfill. The residents there were reluctant to sort the waste. The informant said, "So, take a look at the community gathering. It's just a social gathering or recital, but later we will try to encourage the residents to sort their household waste". Some residents were already using compost fertilizer

from organic waste for rice fields. "So, those who have rice fields use compost fertilizer made of organic fertilizer from household waste. They use it for their rice fields so they can reduce the use of chemical fertilizers. Previously, they used to use 50 kilos chemical fertilizer. But now, they only use 30 kilos of chemical fertilizer, 20 kilos of liquid fertilizer." "However, the community has not made optimal use of waste, both organic and inorganic waste. If you look at the front, there is a security post. It's from bottles. Naba, it's really from the residents. Those are just sticks on the bottles, they're not from bottles, they don't come with the house, ma'am. Oh, I think those bottles are house paint, the bottles are Ridwan Kamil's house. That's right. No, those are the bottles that are just stuck on." For the houses of residents. If they have land behind or next to the house, the waste is still being burned or given to animals for animal feed. "So our waste is here, ma'am, because it's close to the ditch. Well, sometimes we still throw waste next to us, ma'am, because it's close to the ditch. So we sometimes still throw waste next to here, but sometimes we burn it too." It turned out that there is still one RT that doesn't have a waste bank "Well, for the waste bank, for the RT waste bank, there isn't one, ma'am. Well, it's finished straight away. There will be a meeting in the future, for sharing formation regarding the waste bank, ma'am. The problem with biopore is that the majority of people's land has been cemented and ditches have been made for drainage. So we often have floods here, Ma'am, because the cement ditch has no more soil for infiltration. Well, in fact, I agree with biopore. That's it, ma'am, but earlier, ma'am, there's no place for this biopore anymore, everything has become a ditch, closed ditch".

Based on the results of the interviews, there was a commitment from the RT regarding waste donation as an alternative waste management. The RT and residents agreed with the existence of a waste donation program to help reduce waste in urban areas. Through this program, residents can be wiser in choosing waste, starting from home. The proceeds from the waste donation also go back to the residents and go into their respective RT cash to help residents who have BPJS arrears on or can be used for other purposes. Apart from being beneficial for the world, waste donation is also beneficial for the afterlife. "So we support this activity of giving waste donation, but we can't force it on the residents because we know that a

lot of people are reluctant. However, there are also those who support such program. Unwilling to sort the waste because of reluctant is complicated. Maybe we can encourage them to sort which one is good trash to use as fertilizer, which one to be donated, in a simple words like that."

## DISCUSSION

Households did not throw away rubbish every day. Such finding showed that residents did not care about the use of organic waste. This should be the case when the organic fertilizer composting process is a decomposition process carried out by microorganisms on organic materials. The aim of composting is to convert complex organic materials into biologically stable materials.<sup>10</sup> Organic waste has positive value if it is processed properly and correctly, organic waste can be used as compost and a substitute for chemical fertilizers. Apart from making the soil fertile, compost made from the use of organic waste can save farmers, because farmers do not need to spend money to buy chemical fertilizers.<sup>11</sup> The main purpose of organic fertilizer application is to supply nutrients to plants and improve the physical properties of the soil both physically, chemically and biologically. Providing compost fertilizer is an alternative solution or solution to limit the possible negative impacts resulting from the application of inorganic fertilizer. Using compost or organic fertilizer is more environmentally friendly and sustainable.<sup>12</sup>

The study finding revealed that households did not sort waste it was not disposed every day. Thus, there must be an empowerment of the role of the community which is expected to to reduce the volume of waste, but also to process waste to improve the economic value. One of the efforts to be performed is through community waste bank with the aim of maximizing the value of waste in order to create a healthy, clean, green and beautiful environment and most importantly to reduced waste disposal to landfills.<sup>13</sup> All households who were respondents in the Bengkulu city did not sort their waste, which is in line with the results of interviews which showed a lack of internal desire to change their waste sorting behavior. There were still many people who did not sort their waste because so far, they did not know about the benefits of household waste. Managing household waste was felt to be very difficult

because family members were committed to starting from home and there was no natural awareness of the intentions in their hearts. There should be educational and training activities on sorting of waste that can still be used as well as processing household waste. It is expected to provide direct experience to the community on how to sort waste and make a decomposer and its application to make organic fertilizer.<sup>14</sup> There is no sorting towards organic and inorganic waste at home. In addition, un-routine waste disposal may result in a piles of household waste. Improper waste management will certainly have health impacts on family members, namely the emergence of various diseases such as malaria and diarrhea.<sup>15</sup>

In accordance with the study finding, households processed used goods but had not performed it to find the best economic use. Residents used completely organic food for livestock. Recycling organic waste, such as food scraps, leaves and plant waste should also have important benefits, including: 1) Reducing the Volume of Waste. Recycling organic waste can reduce the volume of waste that must be disposed in Landfills or processed conventionally. Organic waste usually makes up a significant proportion of household waste. Furthermore, by recycling, we can reduce the burden of waste that rots and produces greenhouse gases in landfills. 2) Organic Fertilizer Production. Organic waste can be converted into organic fertilizer through the

composting process. This organic fertilizer is a good source of nutrition for plants and can increase soil fertility. By recycling organic waste into fertilizer, we can reduce dependence on chemical fertilizers which can pollute soil and water. 3) Reducing greenhouse gas emissions. When organic waste decomposes naturally in landfills, they produce methane gas, which is a greenhouse gas that contributes to climate change. By recycling organic waste through composting or composting, we can reduce methane gas emissions and its negative impact on global warming. 4) Reducing the use of chemical fertilizers. Chemical fertilizers which are generally used in agriculture can pollute soil and water. 5) Making the soil more alive. Organic fertilizer produced from organic waste can improve soil quality by increasing the organic matter content, increasing water retention, and increasing microbial activity in the soil. This helps create better conditions for plant growth and maintains a sustainable agricultural environment. 6) Environmental education. The practice of recycling organic waste can also be used as a tool for environmental education and awareness. Teaching and involving the community in the process of recycling organic waste can increase understanding of natural cycles and the importance of sustainable waste management.<sup>16</sup>

The current study produced the following waste donation innovation model:

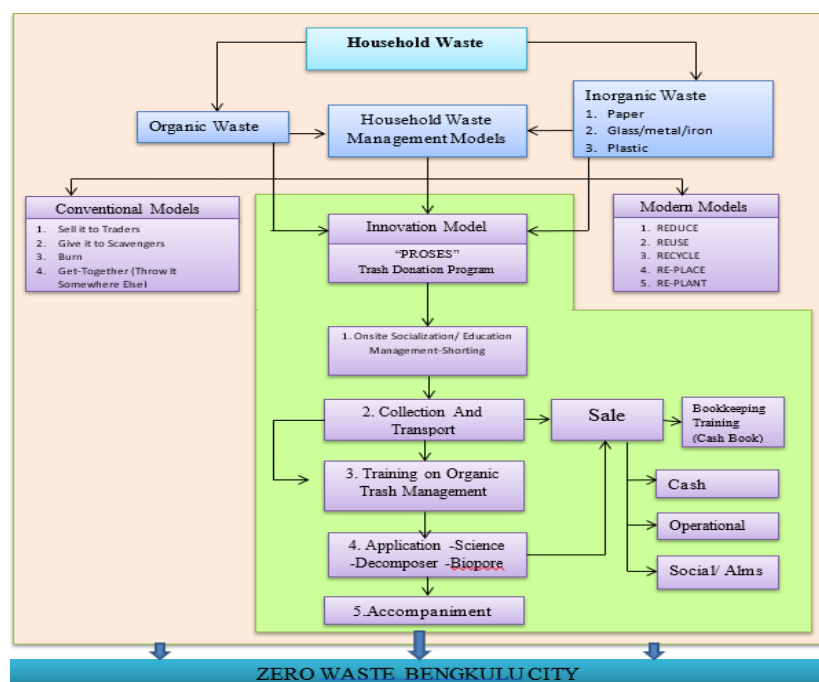


Figure 2. Waste donation Innovation

Food waste is not only an environmental problem but also a social, financial and moral problem. Reducing the amount of waste sent to landfill is a challenge. One solution to improve environmental sustainability is through waste donation.<sup>17</sup> The waste donation movement is an effort to handle environmental problems by utilizing waste, where this waste management is performed through the 5M process or system (socializing, collecting, sorting, selling, and giving). This concept provides a waste management system that is easy and blessed. With the ease of waste management and the active role of residents, it is expected that this will become a sustainable and beneficial program for the community. The forms of waste that can be donated are non-organic types of waste, such as paper, cardboard, plastic bottles, glass bottles, syrup bottles, metal items, plastic items and others.<sup>18</sup> Utilizing resalable waste is a choice for residents to help the family's economy compared to solid waste that is burned, thrown in public places or even thrown away carelessly.<sup>19</sup>

In accordance with the results of interviews with the RT heads and environmental cadres, they were committed and supportive towards waste donation. This program invites residents to not only think about worldly matters but also the hereafter by helping others by giving alms through waste. The study finding is in line with the socialization of the waste donation movement which focused on four aspects: (1) instilling a spiritual-transcendental-based social spirit; (2) technical skills in waste sorting and processing; (3) technical skills in selling waste processing products; and (4) utilization and accountability for the use of the money generated. Waste donation also expands the scope of philanthropy. Conventionally, alms is defined as giving donations in the form of money so that only rich people or those who have excess money can give alms. In the concept of Waste donation, everyone, whether rich or poor, produces waste from their daily life activities. So, basically everyone can give alms.<sup>20</sup> Our opportunity to care for each other in management and processing waste into

something of value is an inevitability that we must realize. Waste management with good management will provide great benefits for ourselves, our children and grandchildren and the nature around us, of course this is an activity that is worth worship in the sight of Allah Ta'ala. Therefore, we are commanded by Allah Ta'ala to take part in all activities which provides benefits, including waste management. It is good to encourage people to reduce, utilize and manage waste in an integrated manner. Integrated waste management is a reflection of piety through increasing personal, social and natural piety, as well as a reflection of Islam as a blessing for all of nature (rahmatan lil 'âlamîn). Efforts to mobilize community-based waste management is based on the Fatwa of the Indonesian Ulema Council Number 47 of 2014 concerning Waste Management to Prevent Environmental Damage, as well as a response to various cases of environmental pollution and health threats resulting from the waste management crisis. Such condition includes various types of waste that was thrown into the sea and damages our marine ecosystem in the long term. The waste problem is closely related to our behavior as the main source of waste. Here, a religious approach can play a role through religious guidance to awaken the spirit of spirituality. This guidance is in line with the national strategy for sustainable waste management through preventing waste generation by each individual, followed by attitudes towards limiting waste generation, reusing waste and recycling waste (Hatta et al., 2021). This study showed that waste donation was one of the commitments in waste management to prevent waste accumulation, in accordance with a study conducted by Norum, 2015 which concluded that youth (18-34 years) were more committed to donating the waste produced compared to those aged over 55 years. Their desire to donate tended to go directly to charities and used goods sellers<sup>21</sup>. Such finding indicated that waste donation could be performed if there was commitment and sincere intentions from family members.

## CONCLUSION

Most households in Bengkulu City were aged 29-58 years, married, had less than a high school education, unemployed,



and had poor levels of knowledge, attitude, and behavior regarding household waste management. There is a need for commitment from the Environmental Service, District, Village, Head of Neighborhood Units (RT), LPM and Community Figures regarding the implementation of the Waste Donation Program. The support of the smallest community unit, namely the Chairman of the Neighborhood Unit, is the key to the success of household waste management among households, especially in sorting organic and inorganic waste. Such practice will help make the waste donation program a success. Waste donation can be an alternative for households in worship and also help reduce the accumulation of waste in Landfills. It is recommended cooperation between the Village Community Empowerment Institution and the Waste Bank in providing routine assistance to the Waste Donation Program. Waste management starts from the household and needs the support of facilities and infrastructure, for example with decomposers or biopores in managing organic waste and training in the use of inorganics as the solutions in changing people's behavior regarding waste management. It is expected that a clean and healthy environment with economic value can be created.

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#### CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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