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THE RECYCLING POTENTIAL OF SOLID WASTE IN JATINEGARA SUB-DISTRICT, EAST JAKARTA

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# THE RECYCLING POTENTIAL OF SOLID WASTE IN JATINEGARA SUB-DISTRICT, EAST JAKARTA

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## ABSTRACT

**Aim:** This study aims to analyze the recycling potential of solid waste in Jatinegara sub-district as a basis for optimizing solid waste management with the 3R principle. **Methodology and Results:** The sampling method to calculate the waste generation rate and composition was based on SNI 19-3964-1994. The sampling results showed that the average waste generation of Jatinegara sub-district was 0.22 kg/person/day or 2.02 liters/person/day. With a population of 328,345 in 2020, the waste generation is 663,055 L/day or 663.05 $m^3$/day. The waste composition comprises 55.02% organic waste and 44.98% non-organic waste. The composition of organic waste that has the potential to be reprocessed is 38.52%. The potential for recycling non-organic waste is determined by identifying the types of waste that waste banks can accept. The composition of non-organic waste that can be recycled is 26.11%. Non-organic waste that has the potential to be sold to waste banks is 96.26% of total plastic waste, 100% of paper waste, 100% of metal waste, and 100% of glass/glass waste. **Conclusion, significance and impact study:** The total waste that can be recycled in Jatinegara sub-district is 64.62%, and the residue generated is 35.38%. Recycling can reduce waste to 372.76 $m^3$/day.

## MANUSCRIPT HISTORY

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## KEYWORDS

- Jatinegara sub-district
- Recycling
- Waste generation
- Waste composition
- Waste potential



turnitin Page 7 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

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## 1. INTRODUCTION

Solid waste management is a current and future significant problem due to population growth and urbanization (Sinha *et al.*, 2014; Ramandey, 2016). In most regions in Indonesia, the solid waste management system still follows the collection-transportation-disposal paradigm. As a result, the accumulation of solid waste in landfills has become uncontrollable (Fitria *et al.,* 2018). Based on statistical data from the DKI Jakarta Environmental Agency, in 2019, the average amount of solid waste disposed of in the Bantar Gebang landfill was around 6700 tonnes of waste every day. The massive volume of solid waste entering the final processing site resulted from the high volume of solid waste generated and the absence of adequate solid waste management (Ramandey, 2016).

According to data from the National Waste Management Information System (SIPSN), Ministry of Environment and Forestry, Indonesia's solid waste reduction rate in 2021 only achieved 15.56%. Meanwhile, waste recycling is essential in sustainable waste management and environmental conservation (Ekanthalu *et al.*, 2020; Chu *et al.*, 2021), which was also stated by Sheau-Ting, Sin-Yee and Weng-Wai (2016) that waste recycling is suitable for reducing the waste production. Recycling and reusing waste will benefit the overall waste management process, from reducing residual waste to creating jobs in the recycling sector (Senzige *et al.*, 2014). Recycling potential of municipal wastes are come from non-organic waste (Siami *et al.,* 2019).

The waste bank is one of the systems for promoting the collection of recyclable waste and educating the public about the importance of recycling (Alias *et al.*, 2019). Therefore, waste banks can solve the municipal solid waste problem by applying the 3R principle (Warmadewanthi and Haqq, 2019). Recycling activities can save production costs and also reduce pollution in the environment. For example, the paper industry is considered the third largest polluter of air, water, and soil. Still, by recycling paper waste, the paper industry can prevent 95% of air pollution from paper production from raw materials (David, Thangavel and Sankriti, 2019).

Indonesia has established Law Number 18 of 2008 on Waste Management which shifts the paradigm from waste disposal to waste recycling (Raharjo, Wulandari and Fitriani, 2021). The Presidential Regulation of the Republic of Indonesia Number 97 Year 2017 concerning National Policy and Strategy for the Management of Household Waste and Waste Similar to Household Waste aims to reduce waste by up to 30% by 2025. To achieve success in the waste management system, it is necessary to identify waste composition as a first step in planning a waste


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turnitin Page 9 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849



management system by observing the potential of waste that can be recycled (Owojori *et al.*, 2020).

Jatinegara sub-district is one of the sub-districts in the East Jakarta Administrative City, which has an area of 10.25 km$^2$ or equivalent to 5.45 percent of the East Jakarta City area and has a population of 328,345 people. Waste management in most parts of the Jatinegara sub-district still applies the old paradigm (collect-transport-dispose). Meanwhile, waste disposed of at the Final Processing Site (TPA) is still mixed with the garbage that has the potential to be reused and can be processed into a form with economic value. This study aims to analyze the potential of waste recycling in Jatinegara Sub-district as a basis for planning waste management with a new paradigm, namely by doing the 3Rs. In addition, research on waste recycling potential through this paper can also be applied to all regions in Indonesia, considering that currently, not all regions have adequate data to plan solid waste recycling programs based on their composition.

## 2. RESEARCH METHODOLOGY

The research was conducted in the Jatinegara sub-district, geographically located between 106°49'35" east longitude and 6°10'37" south latitude. Figure 1 shows the location of the Jatinegara sub-district.

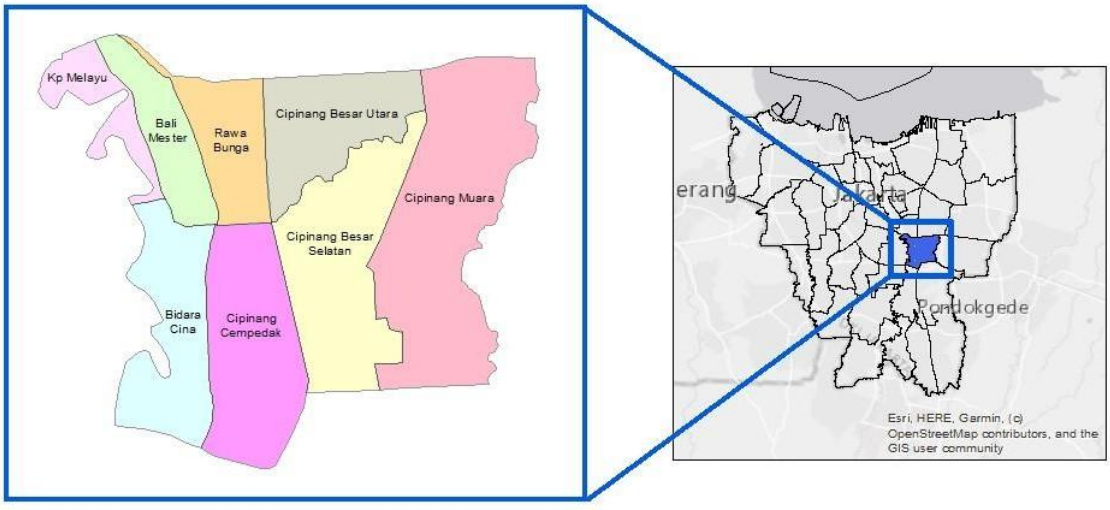


**Figure 1** Location of Jatinegara sub-district in DKI Jakarta Province
(Source: Esri, 2022)


turnitin Page 9 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

turnitin Page 10 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849



## 2.1 Data Collection Method

The data collected in this study consisted of primary data and secondary data. Primary data includes data on the rate of waste generation and composition in Jatinegara Sub-district obtained through sampling for 8 days based on SNI 19-3964-1994 concerning Methods of Taking and Measuring Examples of Urban Waste Generation and Composition. Secondary data includes the total population of Jatinegara Sub-district, the percentage of the economic level of Jatinegara Sub-district community, the percentage of land use, and the types of waste that can be sold to waste banks.

## 2.2 Solid Waste Sampling Method

The use of the stratified random sampling method to determine sample size is a sampling method that is considered heterogeneous, with all individuals having the same opportunity. The sample size was counted according to the economic level of the population, sample locations were selected according to the income level of the community and divided into 3 categories based on the use of electricity capacity in the community and other household facilities. Based on the data from the Population Control Agency of DKI Jakarta, residential buildings at Jatinegara sub-district can be categorized according to their electricity usage capacity with a 13.7% high-income housing percentage, 75.72% middle-income housing and 10.59% low-income housing. The sample size is determined using the formula from SNI 19-3964-1994 as in Equations (1) and (2) :

$$S = Cd\sqrt{PS} \quad (1)$$

Cd is the domestic coefficient (0.5 for average/small city) and Ps is the total population. The sample size (S) is divided by the number of household members (n) to count the number of household samples.

$$K = \frac{S}{n} \quad (2)$$

Sampling equipment and supplies to support activities include 40-liter plastic bags, waste volume measuring boxes, and digital scales. Sampling was conducted for 8 days in representative areas, namely in Cipinang Muaraz Village and Cipinang Besar Selatan Village. These two villages


turnitin Page 10 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

turnitin Page 11 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849


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are the largest in size, so they are sufficient to represent one sub-district. First, waste was collected and weighed using a digital scale. Next, the collected waste was mixed well and placed in a sampling box to measure the waste density. Then, waste samples was sorted according to its composition, such as:

1. Organic waste, including food waste, leaves, and branches
2. Plastic
   a. PET: bottle for cooking oil, jam, soy sauce, chili sauce, and biscuit trays
   b. HDPE: liquid milk and juice bottles, plastic lids, shopping bags, and ice cream containers
   c. PVC: shampoo bottle, tubing, pipe
   d. LDPE: yogurt pots, shopping bags, bread, and fresh food bags, squeezable bottles
   e. PP: cutlery, food containers, tumblers
   f. PS: styrofoam containers
   g. Other: multiplier plastic such as sachets
3. Paper, including HVS, duplex, cardboard, and tetra pack
4. Fabric/textile
5. Metal, including iron, cans, aluminum
6. Glass, including glass bottles, plates, mirrors, and other colored glass
7. Rubber, including rubber bands, rubber slippers, and other rubber in any kind
8. Wood (artificial), including wood plastic composite for furniture
9. Hazardous waste, including medical masks, batteries, electric lights, pressurized cans (aerosols), leftover medicines
10. Other waste, including styrofoam, sanitary waste such as pampers and sanitary napkins, toilet papers, and demolition debris.

### 2.3 Data Analysis Method

The data collected was quantitatively analyzed in a descriptive method, including waste generation, composition, and recycling potential. Waste generation and waste composition were calculated using the following formula:

$$\text{SW generation rate} = (\%\ \text{domestic area} \times a) + (\%\ \text{non domestic area} \times b) \quad (3)$$


turnitin Page 11 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

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$$\text{SW Generation} = \text{SW generation rate x Population} \quad (4)$$

a = domestic waste generation rate; and b = non domestic waste generation rate.

$$\text{SW Composition} = (a \times 100\%)/(\text{Total Weight of SW}) \quad (5)$$

a = waste weight of each component (kg).

There are two types of waste recycling potential: organic waste and non-organic waste recycling potential. Organic waste recycling potential was determined by separating waste that can be reprocessed. According to Damanhuri and Padmi (2018), types of organic waste can be processed in various ways, namely rice, vegetables, fruits, fish, meat, and garden leaves. The following formula was applied to calculate organic waste recycling potential:

$$\%RP = \frac{a}{b} x\ 100\% \quad (6)$$

a = weight of processable organic waste; and b = weight of total organic waste.

For non-organic waste, the potential for waste recycling was determined by looking at the types of waste that can be sold to waste banks. In addition, types of non-organic waste, such as hazardous waste, can be reprocessed by the DKI Jakarta Environment Agency through a third party.

## 3. RESULTS AND DISCUSSION

### 3.1 Solid Waste Generation

Waste generation in Jatinegara Sub-district comes from two sources, namely domestic sources and non-domestic sources. With an average waste density of 95.49 kg/m$^3$, residential areas have the highest waste generation rate, especially in high-income residential areas, as shown in Table 1. Furthermore, the average waste generation rate from 3 types of settlements with a sample size of 70 households is 0.26 l/person/day, and the average waste generation rate from non-domestic sources is 0.11 l/person/day. Based on the percentage of land use in Jatinegara Sub-district, 71.82% of the Jatinegara Sub-district area is domestic, and 28.18% is non-domestic, so

turnitin Page 13 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849



the Jatinegara Subdistrict waste generation rate is 2.02 liters/person/day or 0.22 kg/person/day.

**Table 1** Waste generation rate in Jatinegara Sub-district based on sources

| Sources | Waste Generation Rate | | | | Units |
|---|---|---|---|---|---|
| | kg/unit/day | SD | l/unit/day | SD | |
| High-Income House | 0.30 | 0.07 | 2.57 | 0.60 | person |
| Middle Income House | 0.26 | 0.05 | 2.34 | 0.45 | person |
| Low-Income House | 0.23 | 0.05 | 2.10 | 0.48 | person |
| Offices | 0.03 | 0.02 | 0.60 | 0.45 | employee |
| Store | 0.44 | 0.06 | 4.15 | 0.59 | employee |
| Restaurant | 0.14 | 0.04 | 2.21 | 0.64 | chair |
| Traditional Market | 0.11 | 0.02 | 0.67 | 0.15 | $m^2$ |
| Mosque | 0.03 | 0.01 | 0.46 | 0.10 | person |
| School | 0.01 | 0.02 | 0.30 | 0.32 | student |
| Road Sweeping | 0.01 | 0.01 | 0.15 | 0.06 | m |

**SD: Standard Deviation*

With a population of 328,345 people in 2020, the waste generation in Jatinegara Sub-district in 2020 was 663,055 liters/day or 663.05 $m^3$/day. With a service level of 87%, the waste transported to Bantar Gebang TPST is 576.85 $m^3$/day.

## 3.2 Solid Waste Composition

Waste characterization is one of the essential components of solid waste to determine the best way to manage and treat waste (Widyarsana, Priyanka and Devianto, 2022). Table 2 shows the composition of waste in Jatinegara sub-district. The composition of waste in Jatinegara sub-district consists of 55.02% organic waste and 44.98% non-organic waste. Based on the measurement of waste composition, organic waste is the most significant type of waste generated fromcommunity activities, such as cooking, unsold vegetable and fruit scraps from the market, and street sweeping.

After organic waste, plastic waste is the second most prominent type of waste generated in residential areas in Jatinegara Sub-district (14.25%). Meanwhile, the types of waste that include miscellaneous components, such as styrofoam, sanitary waste, and tissue, are also the third type of waste generated by the community, followed by paper waste. The most common type of


turnitin Page 13 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

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plastic waste in residential areas is LDPE (5.71%), in the form of plastic bags. In addition, other plastic waste types, such as sachets, are also generated (3.51%).

**Table 2** Solid waste composition in Jatinegara Sub-district

| No | Composition | Domestic source (%) | Non-Domestic source (%) | Average (%) |
|---|---|---|---|---|
| 1 | Food waste | 62.38% | 31.88% | 47.13% |
| 2 | Leaves and branches | 0.50% | 15.28% | 7.89% |
| | Total Organic Waste | 62.88% | 47.16% | 55.02% |
| 3 | Plastic | | | |
| | a) PETE/PET | 2.30% | 4.12% | 3.21% |
| | b) HDPE | 1.87% | 0.81% | 1.34% |
| | c) V/PVC | 0.06% | 0.00% | 0.03% |
| | d) LDPE | 5.71% | 4.18% | 4.94% |
| | e) PP | 0.66% | 0.66% | 0.66% |
| | f) PS | 0.24% | 0.99% | 0.61% |
| | g) Other | 3.51% | 7.67% | 5.59% |
| 4 | Paper | | | |
| | a) HVS paper | 0.33% | 3.13% | 1.73% |
| | b) Duplex | 2.21% | 2.26% | 2.23% |
| | c) Tetra pack | 1.09% | 0.15% | 0.62% |
| | d) Cardboard | 1.32% | 6.07% | 3.70% |
| 5 | Fabric/textile | 1.59% | 0.08% | 0.84% |
| 6 | Metal/can | 0.77% | 0.17% | 0.47% |
| 7 | Rubber | 0.10% | 0.09% | 0.09% |
| 8 | Glass | 1.00% | 0.20% | 0.60% |
| 9 | Wood | 0.01% | 0.04% | 0.03% |
| 10 | Hazardous waste | 1.74% | 0.22% | 0.98% |
| 11 | Other waste | 12.61% | 21.99% | 17.30% |
| | Total Non-organic Waste | 37.12% | 52.84% | 44.98% |
| | Total Waste | 100% | 100% | 100% |

Based on the measurement of waste composition in non-domestic areas, organic waste is the highest component of waste generated with an average of 47.16%, which comes from unsold vegetable or fruit scraps in the market, food scraps from restaurants and mosques, and leaves and twigs from street sweeping. Furthermore, the average percentage of the plastic waste component is 18.42%, the paper waste component is 11.62%, and the miscellaneous waste component is 21.99%. The type of plastic waste that is generated the most is other types of

turnitin Page 15 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849


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plastic, as much as 7.67%, such as food and beverage packaging sachets. At the same time, the most produced type of paper is cardboard, as much as 6.07%.

### 3.3 Solid Waste Recycling Potential

Waste recycling potential is the potential for waste from the source to be reused or processed into a proper form to reduce the amount of garbage transported to the Bantar Gebang landfill. Based on the sampling results, the most significant waste component in Jatinegara Sub-district is organic waste consisting of food waste, leaves, and twigs. Based on this condition, organic waste processing efforts are needed to reduce the amount of organic waste generated in Jatinegara Sub-district.

For non-organic waste, not all types of trash can go to the waste bank. Furthermore, the potential must be known in advance by looking at the types of waste accepted by the waste bank. Some types of non-organic waste that can be sold in waste banks are plastic waste, paper waste, metal waste, and glass waste. The waste bank accepts types of plastic such as PET, HDPE, LDPE, PP, and other types of plastic waste. Meanwhile, the waste bank also accepts paper waste such as white writing paper, duplex, cardboard, and tetra pack.

There are 46 types of non-organic waste received by the central waste bank, such as mineral glass, plastic bottles, gallon lids (LD), bottle caps (HD), cardboard, pipes, crackle plastic, shard bottles, iron, black HD plastic or polybags, wire, tapes, aluminum and so on, as shown in Figure 2. The implementation of waste banks is a social engineering activity that invites the community to sort waste because it highlights the importance of increasing public awareness of the need to keep inorganic waste generated by households sorted by type and can be saved in waste banks.

A unit waste bank is a waste bank that covers a particular location, such as a neighborhood area (RW), that functions to make it easier for customers to save and submit their sorted products without having to travel long distances. In Jatinegara Sub-district, unit waste banks are located in every neighborhood in each village. Based on the analysis result, the percentage of non-organic waste reduction in Jatinegara District through waste banks is 1.25%. The waste reduction rate in Jatinegara Sub-district is still far from the target of reducing household and similar household waste in 2021, which is 24%, and achieving a reduction target of 30% in 2025.


turnitin Page 15 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

turnitin Page 16 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849



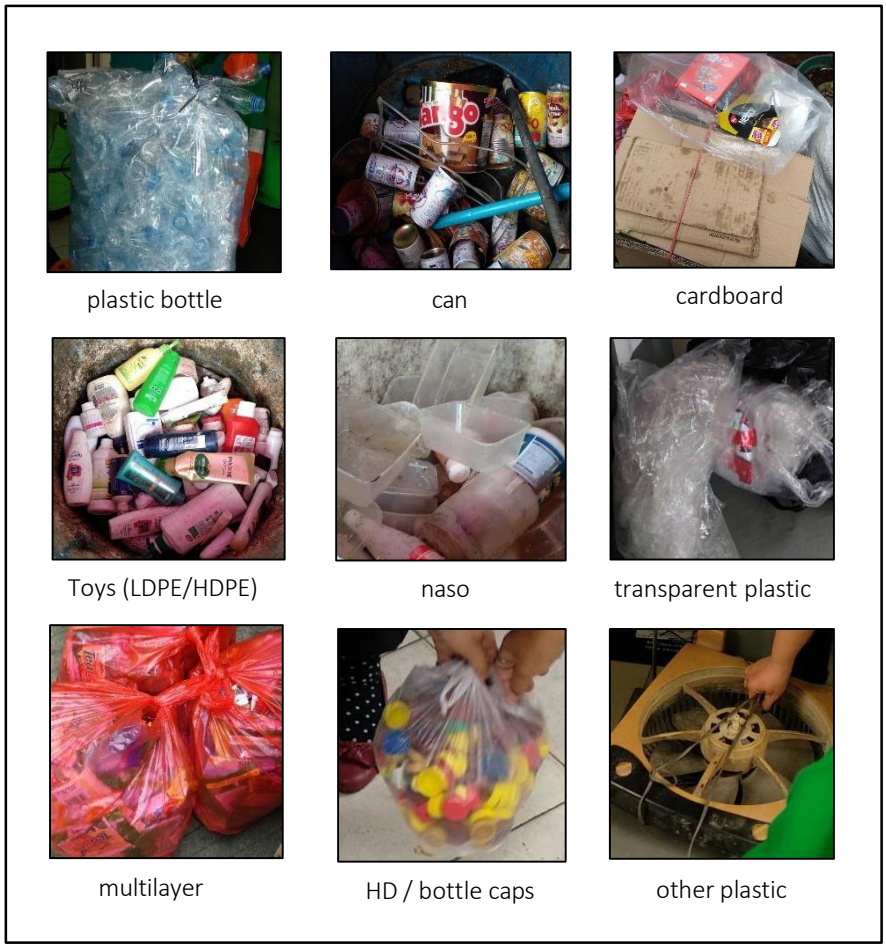


**Figure 2** Examples of valuable waste

The potential of organic waste that can be reprocessed in Jatinegara Sub-district is 70% of organic waste consisting of food waste, leaves, and twigs. Processing of organic waste in Jatinegara Sub-district using the composting method and maggot cultivation is still actively carried out at the Jatinegara Sub-district Environmental Implementation Unit Office. Furthermore, the potential of non-organic waste that can be quantified in Jatinegara Sub-district is 26.11% of the total waste generated. In other words, up to this moment, the potential of non-organic waste that can be acquired in waste banks is 58.05% of the total non-organic waste. The total organic and non-organic waste that can be recycled in Jatinegara Sub-district is 64.62%, and the residue generated is 35.38%. Table 3 shows the potential for waste recycling in Jatinegara Sub-district.


turnitin Page 16 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

turnitin Page 17 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849



**Table 3** Solid waste recycling potential in Jatinegara sub-district

| No | Composition | Component (%) | Accepted in waste bank | Processable | Recycling potential (%) | Residue (%) |
|---|---|---|---|---|---|---|
| 1 | Food waste | 47.13% | | √ | 32.99% | 14.14% |
| 2 | Leaves and branches | 7.89% | | √ | 5.53% | 2.37% |
| | Organic | 55.02% | | | 38.52% | 16.51% |
| 3 | Plastic | | | | | |
| | a) PETE/PET | 3.21% | √ | | 3.21% | |
| | b) HDPE | 1.34% | √ | | 1.34% | |
| | c) V/PVC | 0.03% | √ | | 0.03% | |
| | d) LDPE | 4.94% | √ | | 4.94% | |
| | e) PP | 0.66% | √ | | 0.66% | |
| | f) PS | 0.61% | | | | 0.61% |
| | g) Other | 5.59% | √ | | 5.59% | |
| 4 | Paper | | | | | |
| | a) HVS paper | 1.73% | √ | | 1.73% | |
| | b) Duplex | 2.23% | √ | | 2.23% | |
| | c) Tetra pack | 0.62% | √ | | 0.62% | |
| | d) Cardboard | 3.70% | √ | | 3.70% | |
| 5 | Fabric/textile | 0.84% | | | | 0.84% |
| 6 | Metal/can | 0.47% | √ | | 0.47% | |
| 7 | Rubber | 0.09% | | | | 0.09% |
| 8 | Glass | 0.60% | √ | | 0.60% | |
| 9 | Wood | 0.03% | | | | 0.03% |
| 10 | Hazardous waste | 0.98% | | √ | 0.98% | |
| 11 | Other waste | 17.30% | | | | 17.30% |
| | Non-organic | 44.98% | | | 26.11% | 18.87% |
| Total of Recycling Potential dan Residue | | | | | 64.62% | 35.38% |

According to the analysis of waste recycling potential in Table 3, paper waste in the form of white paper or HVS, duplex, cardboard, and tetra pack have a selling potential of 100% of the total waste generation. Metal and glass waste also have a selling potential of 100%. Meanwhile, plastic waste has a sales potential of 96.26% of the total plastic waste generation because waste banks do not accept PS plastic waste. With a waste recycling potential of 64.62%, the waste generated is recycled 372.76 $m^3$/day, and the residue that goes to TPST Bantar Gebang is


turnitin Page 17 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

turnitin Page 18 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849



204.08 $m^3$/day.

The percentage of organic waste reduction in Jatinegara Sub-district by processing it into compost and maggot feed is 0.203%. Meanwhile, the percentage of inorganic waste reduction in Jatinegara sub-district through waste banks amounted to 1.25%. A waste recycling potential of 64.62% has not been reached due to a lack of community participation in waste management. For example, the results of observations and analysis of waste processing in existing conditions show that only 21% of waste banks in Jatinegara Sub-district routinely carry out waste weighing and saving activities.

## 4. CONCLUSION

The potential for waste recycling in Jatinegara District is 64.62%, and the residue is 35.38%. With the data on recycling potential, a waste management plan can be made with the 3R concept so that the amount of waste entering Bantar Gebang TPST can be reduced according to the potential for waste recycling. To achieve the optimum recycling rate, socialization, education, assistance, and monitoring of the community are needed on an ongoing basis to implement waste segregation from sources with waste grouping consisting of organic and non-organic waste, as well as the 3R concept to reduce waste generation from sources in residential and non-residential areas. It is necessary to optimize waste processing in Jatinegara District through waste banks and TPS 3R to minimize the amount of waste that will be disposed of at Bantar Gebang TPST.

## REFERENCES

Alias, F. S. *et al.* 2019. Enhancing the Potential of Recyclable Waste Collection through Waste Bank Programme : Experience from Hei in Malaysia. *Journal of the Malaysian Institute of Planners*. 17(2): 158-167.

National Standarization Agency. SNI 19-3964-1994. Methods of Taking and Measuring Examples of Waste Generation and Composition of Urban Waste.

Chu, Z. *et al.* 2021. The Potential Value of Recycling Municipal Household Solid Waste in Shanghai,China. *Journal of the Air and Waste Management Association*. 71(3): 285-292. doi:10.1080/10962247.2019.1705435.

Damanhuri, E., dan Padmi, T., *Pengelolaan Sampah Terpadu*, Penerbit ITB, Bandung, 2018, p.153.

David, A., Thangavel, Y. D. and Sankriti, R. 2019. Way To Reduce the Waste. *International Journal of Mechanical and Production Engineering Research And Development*. 9(3): 31-42.


turnitin Page 18 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

turnitin Page 19 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849



Ekanthalu, V. S. *et al.* 2020. Waste Value Potential Analysis of Municipal Solid Waste Produced in the Peri-Urban Area of Zhaoquanying, China. *WIT Transactions on Ecology and the Environment*. 247: 25-34. doi: 10.2495/WM200031.

Fitria, S., Purwaningrum, P. and Indrawati, D. 2018. Analisis Potensi Daur Ulang Sampah di KabupatenLima Puluh Kota, Provinsi Sumatera Barat. *Seminar Nasional Cendekiawan ke 4 Tahun 2018*. d, pp. 753-757.

Ministry of Environment and Forestry. 2022. *National Waste Management Information System of 2021*. Available at: https://sipsn.menlhk.go.id/ (Accessed: 20 July 2022).

Nisa, K. 2020. *Average Amount of Waste Entering The Bantar Gebang Final Waste Disposal Site (TPST), 2019*. Available at: https://statistik.jakarta.go.id/rata-rata-jumlah-sampah-yang-masuk-ke-tempat-pembuangan-sampah-terakhir-tpst-bantar-gebang-2019/.(Accessed:20 April 2022).

Owojori, O. *et al.* 2020. Characterisation, Recovery and Recycling Potential of Solid Waste in a University of a Developing Economy. *Sustainability (Switzerland)*. 12(12): 1-17. doi: 10.3390/su12125111.

Raharjo, S., Wulandari, S. and Fitriani, S. 2021. Waste Bank System Improvement for Electronic Waste Recycling in Indonesia: A Case Study Of Padang City. *IOP Conference Series: Earth and Environmental Science*. 802(1). doi: 10.1088/1755-1315/802/1/012053.

Ramandey, L. B. 2016. Waste Management Strategic Planning (Waste Management in Jayapura City). *Waste Technology*. 4(1): 13-15. doi: 10.12777/wastech.4.1.13-15.

Republic of Indonesia. 2017. *Presidential Regulation of the Republic of Indonesia Number 97 of 2017 concerning National Policy and Strategy for the Management of Household Waste and Waste Similar to Household Waste.*

Senzige, J. P. *et al.* 2014. The potential for Solid Waste Recycling in Urban Area of Tanzania : The case of Dar Es Salaam. *International Journal of Environmental Protection and Policy.* 2(5): 147-152. doi: 10.11648/j.ijepp.20140205.11.

Sheau-Ting, L., Sin-Yee, T. and Weng-Wai, C. 2016. Preferred Attributes of Waste Separation Behaviour: an Empirical Study. *Procedia Engineering*. 145, pp. 738-745. doi: 10.1016/j.proeng.2016.04.094.

Siami, L., Sutiyorini, T., Janah, N. 2019. Municipal Solid Waste Quantification and Characterization in Banyuwangi, Indonesia. *Indonesian Journal of Urban and Environmental Technology.* 2(2): 189-200. http://dx.doi.org/10.25105/urbanenvirotech.v2i2.4359.

Sinha, S. K. *et al.* 2014. Good Practices Regarding Solid Waste Management and Recycling. *International Journal of Scientific & Engineering Research.* 5(5): 956-964.


turnitin Page 19 of 20 - Integrity Submission Submission ID trn:oid:::3618:105508849

Warmadewanthi and Haqq, M. 2019. Implementation of Waste Banks for Reduction of Solid Waste in South Surabaya. *MATEC Web of Conferences*. 276, p. 06021. doi: 10.1051/matecconf/201927606021.

Widyarsana, I. M. W., Priyanka, M. A. and Devianto, L. A. 2022. Solid Waste Analysis and Processing Potential in the Tourism Sector: Case Study in Nusa Dua, South Kuta, Bali. *Indonesian Journal of Urban and Environmental Technology*. 5(2): 181-192. doi: 10.25105/urbanenvirotech.v5i2.13538.