

## ***Waste Valuation and Problems Encountered In Waste Bank Management: A Case Study at BSU ASRI BMP***

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### **ABSTRACT**

*Community participation-based waste management has been carried out by DKLH Jember Regency through the establishment of the Main Waste Bank its derivative organization, namely the Unit Waste Bank at a lower level. In this system, the effort being made is the integration of waste management, starting from the household as a producer, followed by sorting, then depositing it to BSU and ending with delivery to a temporary warehouse so that the waste is handled properly. This article aims to explore the potentials and problems encountered in the management of a Waste Bank which involves the participation of residents while still paying attention to aspects of economic feasibility. The research was carried out using the analitical descriptive via interview and analysis of primary data owned by BSU ASRI BMP with due observance of scientific principles and maintaining the independence and interests of the authors. From the results of the research it is known that waste valuation efforts by providing economic value to each component of waste produced by each household are able to generate citizen interest in sorting and depositing the waste produced. The main contributors in the transfer of inorganic waste from BSU to BSI sequentially are paper, plastic and metal waste with the highest exchange rate ratio in metal waste. The main problem faced in the management of waste banks is the motivation of residents to independently handle daily waste. Besides that, there are also management constraints because the managers are housewives who must divide their time and attention for routine daily activities.*

**Keywords:** Waste valuation, management, organic waste

### **INTRODUCTION**

Waste management has become a global concern, both in terms of quantity and the ever-growing complexity of problems [1]–[3]. The low level of public awareness, the limited landfill area, and the limited ability of local governments in terms of financing and administration are the supporting factors that make the waste problem more complex [4], [5]. In Jember there are 800 ton of waste produce daily which only 300 ton could be manage by the goverment, around 500 ton were not handle properly. In this condition, the handling of household waste cannot only be the responsibility of the government, but efforts are made to become a joint effort by the community itself as a producer of waste. [6]–[8]. We realize that the management model should be based on a valuation of waste so that it has economic value, in other words "in order for people to care, waste must be empowered, it is clearly shown that waste management will generate revenue with economic value"[2], [8]. Community-Based Integrated Waste Management is an approach to waste management that is based on community needs and requests, planned, implemented, controlled and evaluated with the community [4], [5], [9].

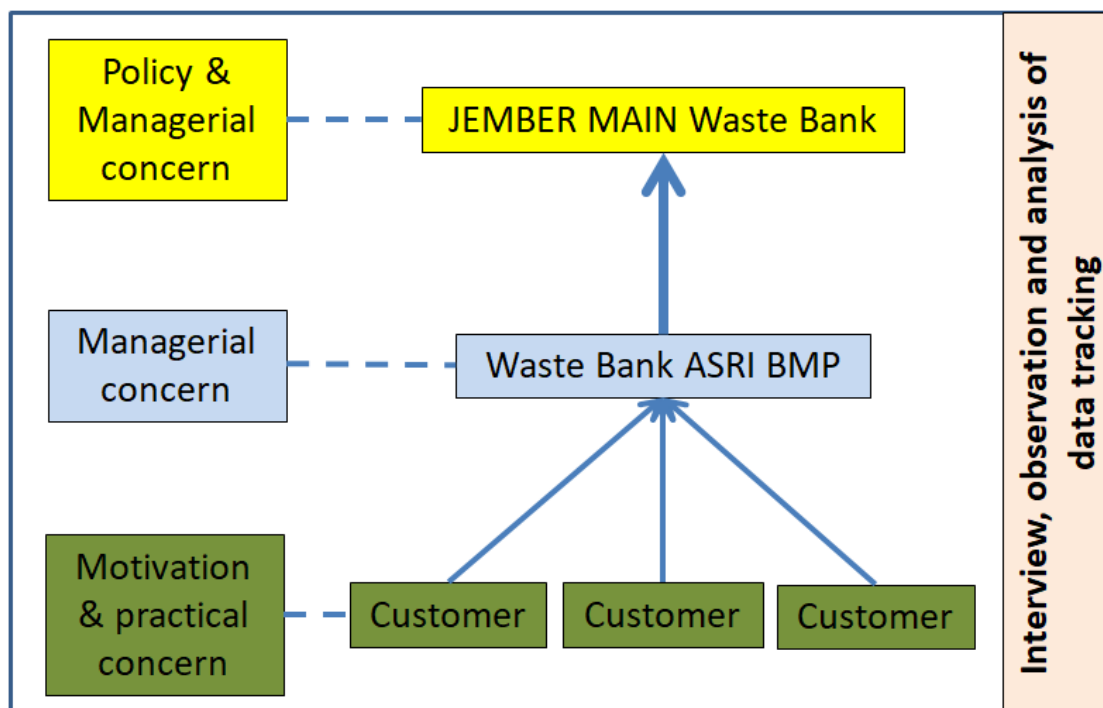
Sustainable waste management must pay attention to the principles of qualitative analysis of waste management which involves 3 aspects, namely the environment, implementation, and institutions [10], [11]. In addition, it is necessary to study quantitatively the efforts that have been made on 5 important aspects in the implementation of sustainable waste management, namely environment, socio-culture, economy, policy, and waste reduction. [10], [12]–[14]. In

general, waste management has become a very important thing considering its connection with increasing population and development of residential areas that occur as a consequence of regional development both in urban areas and new economic growth centres [14]–[17].

This study aims to investigate data and information related to waste management which is carried out based on valuation by considering the economic value of each waste item and the deposit amount is carefully calculated to obtain a fair value. We also explore issues related to technical and non-technical obstacles encountered in the management of the Unit Waste Bank so far that it can be used as a comparison and valuable information for future management improvements.

## METHODS

This study uses the ASRI BMP Unit Waste Bank as a case study which is located at Perumahan Bumi Mangli Permai Blok IF No. 14 RT 01/ RW 15 Kelurahan Mangli Kecamatan Kaliwates Jember Regency. The research data was obtained based on the results of interviews, observations and administrative data tracking owned by BSU (figure 1). The study was conducted for one month from 2 February to 4 March 2023 by utilizing all available data and information to get a complete picture of integrated waste management. BSU ASRI BMP has obtained a Certificate of Registration from DKLH Jember Regency No. 660.1/001.SKTBS/35.09.319/2023 and Business Certificate from Dinas Koprasi dan Usaha Mikro, Jember Regency No. 518/386/324/2022.



**Figure 1.** The main flow of the study which focused on the problem related to each element of the waste management model.

## RESULTS AND DISCUSSION

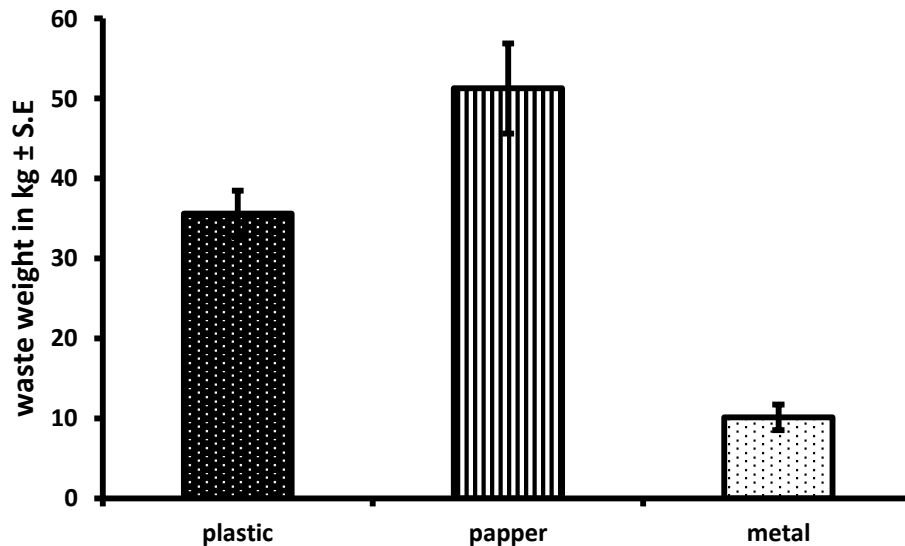
The ASRI BMP Unit Waste Bank (BSU) is currently carrying out inorganic waste management activities through waste sorting, recording and calculating its economic value through the Waste Bank mechanism and organic waste management through the maggot BSF cultivation program which has economic value so that it can add value to the benefits of household waste. In particular, waste bank activities have started since November 2021 with customers starting from the member of Dasa Wisma's in the RT 01 RW 15 and also the surrounding residence. Currently there are 6 Dasa Wisma's BSU customers and 85 individual members scattered in the Bumi Mangli Permai Housing area and its surroundings. In the activities of the waste bank, the customer deposits waste then the waste bank administrators weigh and sort the waste every 2 weeks and the results of the waste sorting will be deposited to the Jember Main Waste Bank with all deposit data carefully recorded so that each depositor can identify the amount of money of successfully collected waste that has been paid. The average data at each weighing is 96.95 kg and the value in rupiah is IDR 142,740 for the total waste that has been successfully sorted and sent to BSI is 2520.7 kg with a value of IDR 3,711,240.

The pattern of waste processing from customers to delivery to BSI at BSU ASRI BMP is as follows; each household sorts the waste generated based on the categories that have been previously socialized. Each type of waste is separated and cleaned in a dry state into plastic containers then deposited every two weeks to BSU (figure 2). Sorting and identification of types of waste is continued by BSU at the time of special weighing and sorting which is carried out at Social Facilities of RT01/15 to then be stored in a temporary storage warehouse. Each type of waste that is weighed is recorded in a special bookkeeping and separated independently for each customer so that the deposit amount and the economic value of the successfully deposited waste can be known. The final stage will adjust to the pick-up schedule by BSI where the waste that has been sorted and put in plastic bags is finally deposited for further processing by BSI.



**Figure 2.** The sortation of the waste by identified the difference of the matter and also economical value into the certain category.

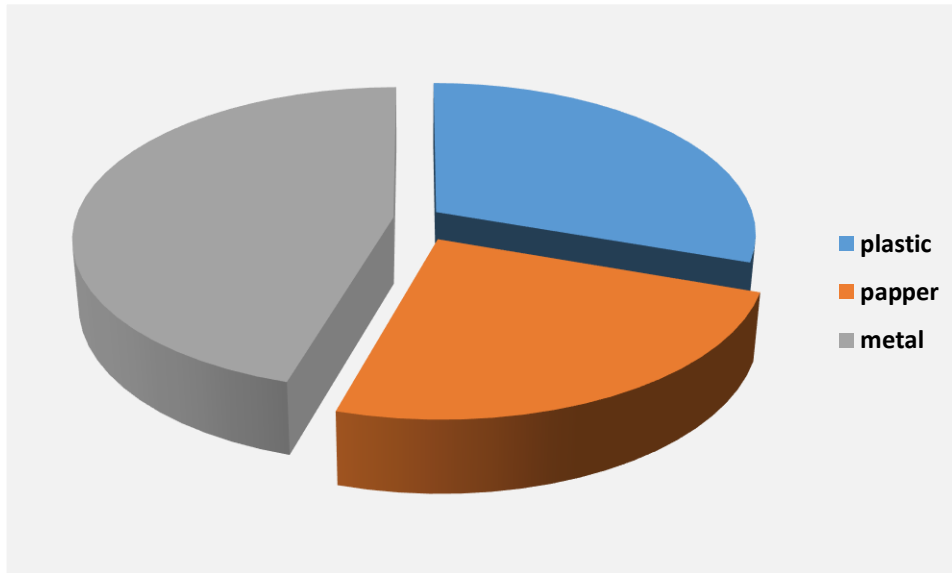
In each weighing session followed by depositing waste to BSI, it is known that there are three main categories of inorganic waste, namely plastic, paper and metal (figure 3). However, there is still contribution from glassware waste and residue, although the quantity is not large enough. Based on the data in BSU's books, there is quite promising potential for used cooking oil as part of organic waste that can be recycled or used for other industrial needs with economic value. The production and utilization of inorganic waste carried out by BSU ASRI BMP is carried out as an effort to contribute to integrated waste management so that the sorting that is carried out can be immediately absorbed by the manufacturer as industrial raw material [1], [5].



**Figure 3.** Contribution of three types of inorganic waste in the deposit session from BSU to BSI every two weeks.

The consistent effort made by BSU to build awareness of inorganic waste management from the RT 01/RW 15 community is to encourage families who are customers to sort their waste first based on the categories that have been previously introduced, this is intended to facilitate the sorting and weighing process. In this stage, not all waste will be disposed of or deposited into BSU, but for some items that are still possible to be reused or used as substitutes for similar goods, this principle is part of sustainable use. In general, sustainable waste management focuses on efforts to utilize waste by adhering to the 3R principles, namely Reduce, Reuse and Recycle. [4], [5], [11], [15]–[17]. These three principals have been applied in stages by BSU members to reduce daily waste production and extend the useful life of daily necessities, which in turn contributes to the total waste that must be disposed of at the Final Disposal Site (TPA).

Waste valuation efforts carried out by introducing price lists for each type of waste up to more than 30 types have been able to stimulate members to sort the waste they produce themselves. Understanding of the economic value of each type of waste has been demonstrated by members of BSU by focusing on sorting by category and not including all categories of waste in one place. This makes sorting work easier when deposits are made from the customer's side to BSU. Broadly speaking, there are three contributors to household waste generated with a significant proportion of exchange rates with significant economic value, with metal waste being the highest, followed by paper and plastic waste whose values are relatively balanced (figure 4). From this data it can be said that waste valuation is an important stage as a stimulant for customer motivation in managing their waste so that it provides economic benefits [10], [12], [17].



**Figure 4.** Comparison of the price ratio of the three main organic waste materials collected and deposited from BSU ASRI BMP each deposit session.

So far, there are a number of problems faced by BSU ASRI BMP in sustainable waste management, including the limitations of managers in managerial and administrative abilities of finance and goods, customer motivation and consistency in sorting and depositing their waste, organic waste whose volume and type are quite significant. To deal with problems related to managerial skills, BSU cooperates with BSI and DKLH Jember Regency who have provided a number of integrated waste management trainings to provide practical knowledge regarding waste segregation procedures, recycling utilization and distribution. Organizing within the scope of BSU has also been arranged to provide opportunities for administrators to assist in carrying out daily activities starting from their duties as director, secretary, treasurer and other organizational devices.

Another problem that is quite prominent is the motivation and consistency of customers to sort and then deposit their waste to BSU on a regular basis; some of these obstacles are related to the habit of sorting and cleaning waste. So far, residents generally dispose of household waste directly into trash cans without sorting or cleaning it. Changing mind-set and behaviour by prioritizing the value of the benefits of goods takes time so the process is not uniform among customers. At this stage it seems that progress is starting to be seen after about a year since BSU ASRI BMP was established where residents are starting to feel the need for waste management because of economic value and appreciation for the value of goods with a longer shelf life. The role of government apparatus at the RT and RW level shows positive participation by providing facilities in the form of storage warehouses and ease of socialization as well as Dasa Wisma's participation as a driving force in waste collection and processing. When referring to the qualitative analysis method to study the management of waste management, it is necessary to carry out 3 aspects, namely the environment, implementation, and institutions [10], [12], [15]. So the waste processing carried out by BSU ASRI BMP has been implemented even though it is still in process and needs to be improved in the future. Ideally, quantitatively, serious efforts have been made towards 5 important aspects in the implementation of sustainable waste management, namely environment, socio-culture, economy, policy, and waste reduction. [2]-[4], [8], [10].



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## CONCLUSION

The sustainable waste management carried out by BSU ASRI BMP has been carried out within one and a half years and has succeeded in collecting and depositing 2520.7 kg of inorganic waste with a value of IDR 3,711,240. The average every time we weighed with an interval of two weeks is 96.95 kg and the value in rupiah is IDR 142,740. From these figures it can be said that BSU's performance in managing waste generated in the environment has been running and is expected to be improved by optimizing organic waste processing to reduce the volume of daily total waste generated by residents. We also identified some problems related to the motivation of the people to manage their own waste in the proper way which already endeavored by the management to be solved through social approachment. The managerial incompetence has been overcome by the involvement of the staff to several training provided by the main waste bank.

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## REFERENCES

- [1] E. Y. Setyawati, Mt. S. Budiastuti, M. Wijaya, and P. Setyono, "Waste management in integrated waste management facility (TPST) of Piyungan to achieve climate resilience through local institutions," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 423, no. 1, 2020, doi: 10.1088/1755-1315/423/1/012018.
- [2] A. A. Kusumadinata, "Pengelolaan sampah berbasis masyarakat community-based waste management," *Media Pengabd. Kpd. Masy. Qardhul Hassan*, vol. 2, no. 1, pp. 25–27, 2016.
- [3] D. Hertati, "Kebijakan Pengelolaan Sampah Berbasis Masyarakat Sebagai Solusi Alternatif Green City Di Kota Surabaya," *Din. Gov. J. Ilmu Adm. Negara*, vol. 7, no. 1, 2018, doi: 10.33005/jdg.v7i1.1200.
- [4] S. Subekti, "Pengelolaan Sampah Rumah Tangga 3R Berbasis Masyarakat," *Pros. Semin. Nas. Sains dan Teknol. 2010*, pp. 24–30, 2010.
- [5] S. Aisyah, S. Fadilah, R. Harta, and A. Karyana, "Pengelolaan bank sampah berbasis masyarakat sebagai upaya menjaga sanitasi lingkungan desa," pp. 450–460, 2018.
- [6] D. Asteria and H. Heruman, "Bank Sampah Sebagai Alternatif Strategi Pengelolaan Sampah Berbasis Masyarakat di Tasikmalaya," *J. Mns. dan Lingkung.*, vol. 23, no. 1, p. 8, 2016.
- [7] K. D. Yuliesti, S. Suripin, and S. Sudarno, "Strategi Pengembangan Pengelolaan Rantai Pasok Dalam Pengelolaan Sampah Plastik," *J. Ilmu Lingkung.*, vol. 18, no. 1, pp. 126–132, 2020, doi: 10.14710/jil.18.1.126-132.
- [8] M. Mahlil, M. Mustaqim, F. Fatimah, and M. Furqan, "Pengelolaan Sampah Berbasis Masyarakat Menjadi Produk Bernilai Ekonomi (Studi Di Gampong Nusa Kecamatan Lhoknga Kabupaten Aceh Besar)," *J. Al-Ijtima'iyah*, vol. 7, no. 1, p. 65, 2021, doi: 10.22373/al-ijtima'iyah.v7i1.9473.
- [9] N. Fikriyah, C. Meidiana, and K. E. Sari, "Penentuan Sistem Pengumpulan Sampah Dan Tempat Penampungan Sementara Desa Sawahmulya, Sangkapura," *Tata Kota dan Drh.*, vol. 14, no. 1, pp. 35–46, 2022, doi: 10.21776/ub.takoda.2022.014.01.5.

- [10] R. S. Abadi, "Keberlanjutan Pengelolaan Sampah Domestik di Kampung Menoreh, Kelurahan Sampangan, Semarang," *J. Pembang. Wil. Kota*, vol. 9, no. 1, p. 87, 2013, doi: 10.14710/pwk.v9i1.6529.
- [11] K. K. Ummatin, N. Bagas, and P. Pratama, "Analisa Perilaku Rumah Tangga Dalam Mengolah Sampah Sebagai Upaya Mendukung Energi Alternatif Refuse Derived Fuel (Rdf)," *Din. Tek.*, vol. 4, no. 1, pp. 40–47, 2021.
- [12] F. Hermawan, "Penerapan Teknologi Waste to Energy (WTE) Pada Rencana Pembangunan Intermediate Treatment Facility (ITF) Sunter Jakarta Utara," no. April, pp. 1–21, 2017.
- [13] P. Purwono, W. Rabiatul, and E. Suyanto, "Strategi Pengelolaan Sampah Rumah Tangga dengan Model Sirkular di Wilayah Perkotaan Purwokerto Household Waste Management Strategy with Circular Model in Purwokerto," *Bul. Kesehat. Lingkung. Masyarkat*, vol. 41, no. 2, pp. 108–115, 2022.
- [14] R. Magriaty, K. Murtiaksono, and S. Anwar, "Analisis K-Means Cluster untuk Identifikasi Kawasan Pengelolaan Sampah di Kabupaten Tapin Provinsi Kalimantan Selatan K-Means Cluster Analysis for Identifying Waste Management Zone at Tapin District South Kalimantan Province," vol. 7, no. 1, pp. 79–90, 2023.
- [15] B. W. Anastasia and L. Arif, "Strategi Pengelolaan Sampah di Kota Mojokerto dalam Perspektif Analisis Strengths, Opportunities, Aspirations, Results," *J. Educ. Hum. Soc. Sci.*, vol. 4, no. 4, pp. 2623–2633, 2022, doi: 10.34007/jehss.v4i4.1129.
- [16] I. J. Wiranata, A. Inayah, and T. Rachmawati, "Praktik Pengelolaan Sampah Terbaik Dunia : Analisis Kelemahan Bandar Lampung," vol. 5, no. 1, pp. 33–44.
- [17] V. V. O. Nafurbenan, M. Manaf, and R. Latief, "Partisipasi Masyarakat Dalam Pengelolaan Sampah di Distrik Bintuni Kabupaten Teluk Bintuni," *Urban Reg. Stud. J.*, vol. 4, no. 2, pp. 75–83, 2022, doi: 10.35965/ursj.v4i2.1394.