

The Effect of Economic Growth on Increased Household Waste in Semarang City

Agung Kurniawan^{1*}, Ashlikhatul Fuaddah²

¹Department of Sociology, Jenderal Soedirman University

²Department of Communication, Jenderal Soedirman University

agung.kurniawan@unsoed.ac.id, orchid: 0000-0002-4917-8331

Abstract

The increasing pollution levels are one of the many problems related to nature and environmental sustainability. Several cities in Indonesia have started to address the waste problem and seek solutions to deal with it. One such city is Semarang, the capital of Central Java Province. Many factors contribute to the increase in waste generation, including economic levels, city centers, industrial centers, low environmental awareness, and education centers. The relationship between these elements shows an increase in the amount of waste in Semarang. The city's economy is developing rapidly compared to other areas in Central Java, even surpassing national growth. The Semarang City Government has implemented various waste management models, such as waste banks and paid plastic bags. Despite these efforts, the government has failed to address the problem adequately, without realizing that households are the largest contributors to daily consumption. Data shows that women are the most involved actors in household domestic activities related to waste sorting. This study was conducted using a mixed-method approach. Public awareness of waste sorting from home by the community was found low before being transported to the waste collection center. This is even though waste sorting plays an important role in reducing the generation of accumulated waste, thereby contributing to environmental sustainability. Additionally, it increases public awareness to actively participate in protecting the environment.

Keywords: Waste Sorting; Garbage Generation; Urban

1. Introduction

The exploitation of nature by humans is leading to its destruction, which will have a profound impact on human well-being. Unfortunately, many of us seem indifferent to the potential environmental harm caused by human activities. Due to this lack of awareness, new disciplines and movements have emerged to advocate for protecting nature. These disciplines emphasize the need to establish a harmonious relationship between humans and the environment and strive to raise awareness about the importance of environmental conservation. The growing amount of waste generated and ineffective waste management is a significant environmental problem today. Changing consumption patterns, urban development, and the rapid growth of industries have all contributed to this increase in waste. Waste is essentially defined as unused materials or materials that require processing to protect environmental and developmental sustainability. (Thoyyibah & Warmadewanthi, 2023).

The rate of waste generation in an area is significantly influenced by various factors, including community income, house size, level of community concern, and willingness to sort waste. An increase in people's income leads to higher public consumption of goods and food, increasing waste generation. Socioeconomic, demographic, regional, and environmental factors influence consumption patterns in different countries. Most waste generation issues stem from human activities. Economic growth and population size contribute to the accumulation of waste, as humans are the primary drivers of production and consumption patterns, ultimately leading to waste generation. Based on data from the National Waste

Management Information System (SIPSN) of the Ministry of Environment and Forestry, waste management performance has improved in 133 districts/cities across Indonesia. The country generates a total of 16,319,353.67 tons of waste per year, with 76.96% (12,559,176.15 tons per year) being managed and 23.04% (3,760,177.52 tons per year) being unmanaged. Of the total waste generated, 44.3% comes from households, 23.6% from traditional markets, and 10.1% from industrial estates.

The urban population, particularly in Semarang City, is rapidly increasing according to the data. (Dinas Kependudukan Dan Pencatatan Sipil Kota Semarang, 2022) The number of people who increased reached 911 from December 2021 to June 2022. Based on this data, it can be concluded that the increasing population is causing a buildup of garbage in cities. According to (Rosmidah, 2016) The city's population increase is mainly caused by urbanization and high birth rates. The lifestyle and consumption patterns of urban people also contribute to the waste problem in cities. Additionally, the high population density of the city contributes to the increase in waste production.(Gatta et al., 2022). The Semarang City Environment Agency (DLH) reports that 1,110 tons of waste are generated daily, predominantly from households. Although the Semarang City Government has implemented strategies like establishing waste banks in every village and charging for plastic bags, these measures have not been effective in reducing the amount of waste sent to landfills. Household waste remains the most pressing issue in Indonesia and requires immediate attention.

Sorting and processing waste from people's household kitchens is one way that can be done. The current waste management paradigm is not enough to solve the problem of high waste accumulation, especially waste generated from households. Especially for communities that use waste transportation services, most people only collect garbage, then transport it by officers, and throw it at the polling station without going through the sorting process first. This waste sorting process can be carried out by all family members so that the amount of waste disposed of is reduced from upstream to the time it is transported and disposed of at the landfill (TPS) and landfill (TPA). According to (Karmila, 2012) In Indonesia, waste segregation is not well implemented. Although various strategies and anticipations such as recycling and composting have been carried out, they are only limited to a few locations. The landfill land is not expanded, so the volume of waste transported from residents' homes to the landfill continues to increase. All family members have an important role to play in household waste sorting, and everyone needs to understand the importance of maintaining the environment (Setyawati & Priyo, 2020).

The active involvement of all family members in waste sorting has a strong correlation with improving environmental quality. It has been proven that when all family members participate together in a community, it helps keep the environment clean, green, and sustainable (Irwan, 2009). To enhance environmental quality, it's important to increase the involvement of families and communities in sorting household waste. This demonstrates their concern about environmental degradation, including issues like foul-smelling sewers, contaminated water sources, garbage-filled puddles, and flooding during the rainy season. The purpose of this study is to explore the relationship between economic growth and household waste sorting and the increase in urban waste generation in Mijen District, Semarang City. This study aims to understand how economic growth affects the amount of urban waste generated. It will also serve as a basis for more efficient waste planning and management that aligns with population growth and increasing economic activities in the community. This research will provide new insights into the socio-economic factors influencing the increase in waste generation in urban areas. Conducting this research is important because urban areas require a comprehensive and integrated approach to address environmental problems.

2. Method

In this study, two approaches (mixed methods) were used: the quantitative approach and the qualitative approach. The quantitative approach involved surveys supported by qualitative data. The qualitative approach focused on examining the relationship between variables and questioning the research hypothesis, both directly and indirectly (Creswell, 1998). Primary data were collected through surveys and interviews with members of the waste-hauling community. Surveys were used to gather quantitative data on the household waste sorting process, while qualitative data was obtained from interviews with informants using pre-made question guides. Secondary data was obtained from literature research, including books, relevant scientific journals, and other related documents.

In this study, a simple randomization method was used for sample selection. This means that every individual in the population had an equal chance of being selected as a sample, and the selection of one person did not impact the selection of others. The analysis of qualitative data involved three stages: data reduction, data display, and verification. Triangulation was used in this study to clarify or compare data and information from various sources, reducing the possibility of misinterpretation. According to Moleong (1999), qualitative research begins with the researcher's understanding of the problem, which guides the research and the application of information standards. This study investigated six villages in Mijen District, Semarang City: Jatisari Village with 51 respondents, Mangkang Kulon Village with 51 respondents, Penggaron Kidul Village with 50 respondents, Polaman with 50 respondents, Purwosari with 35 respondents, Sambiroto with 50 respondents, and Sendangmulyo with 50 respondents.

3. Results and Discussion

3.1. Waste Management Issues in Semarang City

Cities are large permanent settlements with diverse populations from various cultural backgrounds and social classes. They are seen as symbols of opportunity and progress for people from rural areas looking to enhance their standard of living. While cities can contribute to issues such as poverty and pollution, they also have a significant impact on the surrounding economy (Zahnd, 2006). According to Regulation No. 2 of 1987 from the Minister of Home Affairs of the Republic of Indonesia, a "city" is a residential area with various community activities that exhibit characteristics of city life and have clear administrative boundaries established by laws and regulations.

Semarang, as the capital of Central Java Province, attracts people from surrounding areas in search of better job opportunities. It is one of the major cities in Indonesia, offering various facilities such as education, health care, economy, industry, and tourist attractions. However, the city faces several urban problems including pollution, floods, traffic congestion, crime, slums, and waste generation. These issues have arisen due to the city and the environment reaching their limits in terms of capacity and carrying capacity. Therefore, further study is necessary to find the best solutions to these problems, with a focus on waste generation.

Many major cities in Indonesia are grappling with pollution issues stemming from industrial activities and the increasing number of motor vehicles. According to iqair.com, which measures the US standard air quality index, Jakarta, Surabaya, Bandung, Semarang, Palembang, and Makassar are the six Indonesian cities with poor air quality in 2021. These cities are experiencing rapid economic growth and population expansion, with Semarang standing out for its population growth being in line with its economic growth rate and population density. Research (Martuti, 2013) shows the air quality of the city of Semarang which is alarming with high CO levels.

Semarang, as the capital city of Central Java, is experiencing rapid development in various areas including education, transportation, and business. This growth is attributed to its high economic classification, which includes industry and trade, leading to increased waste generation. Research (Prajati

et al., 2015) when it comes to waste generation, Semarang ranks higher than Medan and Bandar Lampung in clustering major cities in Indonesia with garbage piles. This is due to plantation, port, and trade activities. The low level of service and community participation in waste transportation services also contributes to the high waste generation in Semarang.

3.2. Improving the Community's Economy and Reducing Waste Accumulation

The growth of population in an area is linked to an increase in economic activities within the community, leading to overall economic growth and higher individual incomes. This rise in income is associated with greater consumption of public goods and services, increasing the amount of waste generated from public consumption. This information is based on a statement released by BPS (Subdirektorat Statistik Lingkungan Hidup, 2018) The Human Development Index (HDI) and the Gross Domestic Product (GDP) of a region have a mutually influencing relationship. This means that improved socio-economic conditions in a community can lead to lower concern for waste management. Based on data collected by (Pemerintah Kota Semarang, 2022) The human development index (HDI) of Semarang city continues to rise, as indicated by data released by the city government. The HDI of Semarang has increased every year and is higher than the HDI of Central Java Province and the National HDI Index.

Semarang City in Indonesia has experienced a positive annual economic sector growth rate. This growth aligns with the increase in the city's human development index, indicating an improving economic condition. The growth in the economic sector reflects an increase in production and income, which positively impacts the community's economy. Data-driven (Pemerintah Kota Semarang, 2022) The data shows that the economic growth rate (LPE) of Semarang city is higher than the average of Central Java and the national average, despite a decline during the COVID-19 pandemic in Indonesia, which has had an impact at the national and global levels. Below is a graph depicting the economic growth of Semarang city, Central Java prince, and the entire national.

One of the driving factors for the increase in the amount of waste generated in Semarang city is the increase in the community's economy, especially domestic waste generated from people's daily consumption. Based on national waste generation data issued by (Kementerian Lingkungan Hidup, 2022) It is indicated that Semarang has the highest waste generation in Central Java in 2022, as depicted in the image below.

Picture 1. Composition of Waste Generation in Central Java Province



Source : sipsn.menlhk.go.id

According to the data provided, Semarang has the highest waste generation in Central Java. The city government, as stated in the Semarang white paper on waste management, has been making efforts to reduce the amount of waste generated. (Bappeda Kota Semarang, 2020) such as adding a waste bank, limiting the use of plastic in supermarkets, and adding TPST/TPS3R. However, according to the same source,

there are around 60 tons of waste per year from public consumption that is not properly managed, data shows that the average waste transported to the landfill in the city of Semarang is 1,110 tons per day. The high amount of waste that is then transported and accumulated in the landfill must be overcome jointly by all parties, both by the government and the community by sorting or separating first by the community before being transported by waste carriers. (Andina, 2019) stated that to support the composting and recycling process, the community can sort organic and non-organic waste by separating dry and wet waste. Therefore, the process of sorting waste at home carried out by the community is an important part of efforts to reduce the volume of waste in Indonesia.

3.3. Waste Sorting Starts at Home

Household waste sorting demonstrates community awareness of environmental protection. Protecting the environment is the responsibility of every individual and family. This is in line with research conducted by (Yasin et al., 2021) research findings indicate that residents in clear zone communities prioritize ecological sustainability through household waste processing activities. People living in Mijen District, Semarang city, quite understand the importance of preserving nature. Most people subscribe to local waste treatment site cleaning service providers to avoid waste that pollutes the environment. However, many people who have subscribed to hygiene do not know how to sort garbage from home. As a result, they believe that TPS is responsible for the cleanliness of the environment, including the separation of their waste. The results of the study showed that there were only a few people who sorted waste (organic and non-organic) at home before handing it over to TPS officers involving all family members.

Based on research conducted in the Mijen District area, it was found that household waste sorting is predominantly carried out by women. However, in some societies, the entire family participates in waste sorting. The study revealed that only about fifty families worked together in waste management, with the father playing a leading role in most families. The continuous increase in waste generation due to human behavior is one of the causes of environmental damage. Small changes are necessary to halt the destruction of the environment and nature. This can begin by altering the way people perceive their environment. All family members are important in promoting this awareness as they are responsible for household consumption and have the potential to collectively change their mindset, especially regarding waste management. It is expected that families will develop an awareness of the importance of waste sorting to address environmental issues stemming from unresolved waste.

The results of the assessment of the environmental concern index in 2018 carried out by (Subdirektorat Statistik Lingkungan Hidup, 2018) covering all provinces in Indonesia, many private transportation in Central Java cause waste management and pollution problems. The data shows that the community needs to better understand waste management. The participation of the community in transporting garbage by cleaners shows public awareness of the waste problem, even though it is related to the economic side so that not all people subscribe to cleanliness because they have to pay the cost of garbage delivery. In addition, another behavior of the community is to burn their garbage around the house to reduce the amount of garbage in the residential environment which can pollute the air due to smoke from combustion.

The separation of household waste and similar waste is regulated by Government Regulation No. 81 of 2012. This regulation divides waste into four types: waste with hazardous content, biodegradable waste, recyclable waste, and other types of waste. Therefore, waste sorting must start at residents' homes to assist in further processing carried out by TPS and TPST officers. Sorting household waste at its source offers numerous benefits to the community. It allows for the separation of organic waste for composting and waste with economic value for sale (Kahfi, 2017). The study results indicate that many people still do

not engage in waste sorting. Several reasons for this include not having a designated person responsible for waste management, lack of time, and the unclean and unpleasant environment.

According to the research findings, there are four primary reasons why families frequently separate waste at home. The first reason is linked to water pollution in waterways, contaminated drinking water sources, and river pollution leading to fish mortality and foul smells. Menurut (A. Arni & Susilawati, 2022) one of the most polluted water sources in Indonesia is rivers. This pollution comes from two sources, namely domestic and industrial waste and residential activities. Families also sort waste from home because of perceived aesthetic damage, such as slum environments and soil and air pollution, such as garbage that does not decompose easily causing a pungent odor. Such as research conducted by (Hasibuan, 2016) which shows that household waste or garbage is waste that comes from daily activities that have an impact on environmental quality. Since the environment plays the most important role in supporting people's lives, it is important for people to become more concerned about the environment, even by starting with small actions such as household waste sorting. When there are healthy community activities, it is hoped that it will improve the quality of people's lives and contribute to national development.

Basically, the waste problem cannot be solved by the government alone, cooperation and active roles from various parties are needed, starting from the community who contribute the largest amount of waste from daily consumption. Our basic right as citizens is to live in a healthy environment. Therefore, maintaining and maintaining the environment together is the obligation of all of us as members of society. Since household activities cause most of the waste, every family member is expected to have a role in preserving the environment, this is because family and nature are closely related (Andina, 2019). It is hoped that, starting from small actions taken by families as an important part of household responsibility, having awareness to save and protect the environment where they live by taking simple actions such as sorting waste from home, will be able to improve the quality of waste processing and increase public awareness to maintain ecological sustainability for the next generation.

4. Conclusion

The city of Semarang as one of the major cities in Indonesia, has a rapidly developing economy. This is faster than other regions in Central Java and even surpasses national economic growth. In addition to other factors such as trade and education, industry is the main contributor to economic growth. As a result, Semarang became a popular place for people to pit their fate, find a job, and get an education, so the population increased. The high number of people is related to the high level of community waste, especially household waste caused by human consumption. To prevent the problem of sustainable waste that can cause environmental damage, the Semarang city government must find the best solution by involving community participation. As the largest waste producer, the community must participate in the problem of waste handling. Most of the residents of Semarang have been sorting waste since they are at home, showing their awareness to take part in protecting the environment and reducing the amount of waste transported by officers to the local landfill. All family members must sort the waste. This will instill a common awareness to protect the environment. Waste sorting is based on the awareness that people directly feel environmental damage such as water, soil, and air pollution. The behavior of waste sorting carried out by some families is an example of an environmental awareness movement that pays attention to the wishes and concrete actions of the community to protect and save the environment around their residence.

5. Conflict of Interest

There is no conflict of interest related to the writing or publication of this article.

6. Acknowledgement

The authors must use this section to thank people who helped them with completing the studies or preparing the paper. This can include anyone who provided technical assistance to the author or someone who had a helpful discussion with him/her, it also can be used by the author to acknowledge the funding agency, if any, which supported this research. If multiple agencies gave grants, list them separated by commas.

7. References

- [1] Andina, E. (2019). The Analysis of Waste Sorting Behavior in Surabaya. *Jurnal Aspirasi*, 10(2), 119–138. <https://doi.org/10.22212/aspirasi.v10i2.1424>
- [2] Arni, A., & Susilawati. (2022). Pencemaran air sungai akibat pembuangan sampah di desa bagan kuala tanjung beringin Kabupaten Serdang Bedagai. *Nautical : Jurnal Ilmiah Multidisiplin*, 1(4), 241–245.
- [3] Arni, N., & Nur, A. (2021). Resistensi Perempuan terhadap Kuasa di Balik Kasus Perampasan Ruang Hidup: Studi Ekofeminisme. *Najwa: Jurnal Muslimah Dan Studi Gender*, 1(1), 60–72.
- [4] Bappeda Kota Semarang. (2020). *Buku Putih Semarang Kelola Sampah 2020*. Bappeda Kota Semarang.
- [5] Dinas Kependudukan Dan Pencatatan Sipil Kota Semarang. (2022). *No Title*. dispendukcapil.semarangkota.go.id/statistik/jumlah-penduduk-kota-semarang/2022-06-16
- [6] Farhan, M., & Subroto, M. (2023). Jurnal komunikasi hukum. *Jurnal Komunikasi Hukum, Volume 7 Nomor 1 Februari 2021*, 9(1), 1105–1118. <https://ejournal.undiksha.ac.id/index.php/jkh/issue/view/863>
- [7] Gatta, R., Anggraini, N., Jumadil, Asy'ari, M., Mallagennie, M., Moelier, D. D., Hadijah, & Fauziah Yahya, A. (2022). Transformasi Peran dan Kapasitas Perempuan Rumah Tangga dalam Pengelolaan Sampah Rumah Tangga di Kota Makassar. *Jurnal Penyuluhan*, 18(02), 265–276. <https://doi.org/10.25015/18202237888>
- [8] Hasibuan, R. (2016). Analisis dampak limbah/sampah rumah tangga terhadap lingkungan hidup. *Jurnal Ilmiah "Advokasi,"* 04(01), 42–52. <https://www.google.com/search?client=firefox-b-d&q=jurnal+issn+rosmidah+hasibuan>
- [9] Kahfi, A. (2017). Tinjauan terhadap pengelolaan sampah. *Jurisprudentie*, 4(1), 12–25.
- [10] Karmila, R. M. (2012). Tangga Di Rw 02 Kelurahan Neglasari Kecamatan. *Jurnal Ilmu Administrasi*, 1, 69–102.
- [11] Kementerian Lingkungan Hidup. (2022). *Data Timbulan Sampah Provinsi Jawa Tengah*. sipsn.menlhk.go.id
- [12] Martuti, N. K. T. (2013). Peranan Tanaman terhadap Pencemaran Udara di Jalan Protokol Kota Semarang (The Role of Plants Against Air Pollution in The Protocol Street of Semarang City). *Biosantifika*, 5(1), 37–42.
- [13] Pemerintah Kota Semarang. (2022). *Rencana Kerja Pemerintah Daerah Kota Semarang Tahun 2022*. Bappeda Kota Semarang.
- [14] Prajati, G., Damanhuri, T. P., & Rahardyan, B. (2015). Pengaruh Faktor-Faktor Ekonomi Dan Kependudukan Terhadap Timbulan Sampah Di Ibu Kota Provinsi Jawa Dan Sumatera. *Jurnal Tehnik*

Lingkungan, 21(1), 39–47. <https://doi.org/10.5614/jtl.2015.21.1.5>

- [15] Rosmidah Hasibuan. (2016). Analisis Dampak Limbah Sampah Rumah Tangga Terhadap Pencemaran Lingkungan Hidup. *Jurnal Ilmiah "Advokasi,"* 04(01).
- [16] Setyawati, E. Y., & Priyo Siswanto, R. S. H. (2020). Partisipasi Perempuan Dalam Pengelolaan Sampah Yang Bernilai Ekonomi Dan Berbasis Kearifan Lokal. *Jambura Geo Education Journal*, 1(2), 55–65. <https://doi.org/10.34312/jgej.v1i2.6899>
- [17] Shiva, V. dan M. M. (2005). *Ecofeminisme: Perspektif Gerakan Perempuan dan Lingkungan. Diterjemahkan oleh Kelik Ismunanto & Lilik*. IRE Press.
- [18] Subdirektorat Statistik Lingkungan Hidup. (2018). *Laporan Indeks Perilaku Ketidakpedulian lingkungan hidup indonesia 2018* (Subdirektorat Statistik Lingkungan Hidup (ed.)). Badan Pusat Statistik.
- [19] Thoyyibah, S., & Warmadewanthi, I. D. A. A. (2023). Pengaruh Faktor Sosial Ekonomi terhadap Laju Timbulan dan Komposisi Sampah Rumah Tangga di Kecamatan Jombang. *Jurnal Teknik ITS*, 12(1), 1–6. <https://doi.org/10.12962/j23373539.v12i1.106194>
- [20] Wijayanti, I., Kusuma, N., & Pneumatica, O. (2019). Gerakan Ekofeminisme Dalam Pemberdayaan Perempuan Pengolah Limbah (Studi Kasus Komunitas Pengolah Limbah di Desa Narmada). *RESIPROKAL: Jurnal Riset Sosiologi Progresif Aktual*, 1(1), 40–52. <https://doi.org/10.29303/resiprokal.v1i1.4>
- [21] Yasin, F., Salviana Darvina S, V., & Su'adah, S. (2021). Ecofeminism Movement Through Household Waste Management In The Zona Bening Community, Batu City- East Java. *Jurnal Perempuan Dan Anak*, 4(2), 104–119. <https://doi.org/10.22219/jpa.v4i2.19175>
- [22] Zahnd Markus. (2006). *Perancangan Kota Secara Terpadu*. Kanisius.