

LEADERSHIP AS A CATALYST FOR ACHIEVING SUSTAINABLE WASTE MANAGEMENT (CASE STUDY IN SEMARANG CITY)

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ABSTRACT

Waste generation provides a significant global challenge including that is in Indonesia. The accumulation of wastes will continue to escalate and lead to adverse impacts on the environment and human ecosystems if there is no effective waste management. In response to this issue, waste management initiatives like waste bank utilizing 3Rs (reduce, reuse, and recycle) approach have emerged in various regions of Indonesia, including the Semarang city. The city of Semarang was selected for this research as it is in the top rank in the Province of Central Java for the waste generation. The success of these programs on waste banks depends heavily on the leadership that motivates and engages the community. However, there is limited scholarly attention on the role of leadership in waste management, especially in specific contexts like waste banks. While previous studies have explored waste management practices, they rarely address the appropriate leadership styles necessary for these initiatives. Existing research on leadership often focuses on public organizations, awareness campaigns, and stakeholder involvement but does not directly link leadership styles to waste management systems. Considering that research on the role of leadership on waste management and on leadership style suitable for managing wastes are still limited, this research focuses on leadership type/style conducive for effectiveness of waste bank management in the city of Semarang. This study aims to identify leadership style most conducive to the effective management of waste banks in the Semarang city. Based on the analysis of a survey of 177 respondents across 16 sub-districts, transformational leadership was found to be the most effective in mobilizing community participation for sustainable waste management in the city.

Keywords: Leadership, Waste Management, Waste Bank

INTRODUCTION

Waste generation has been becoming a global problem including that is in Indonesia. According to the data of the Information System of National Waste Management (*Sistem Informasi Pengelolaan Sampah Nasional*, SIPSAN) of Indonesia, 317 regencies/cities produced 38,239,557.16 ton wastes in 2023. Of the total, 14.05% wastes were from the province of Central Java. Tracking it further, the city of Semarang produced the biggest amount of the wastes with 431,534.65 ton annually. On the contrary, Magelang produced the least wastes amounted 29,400.33 ton per year. Based on their type, 60.8% of the wastes were food wastes and 72% were produced by the households (Ayu, Safitri Dika, 2023; Becerra et al., 2021). It is reasonable to focus on the city of Semarang as it is on the top rank in waste generation in the Province of Central Java and thus solutions are needed.

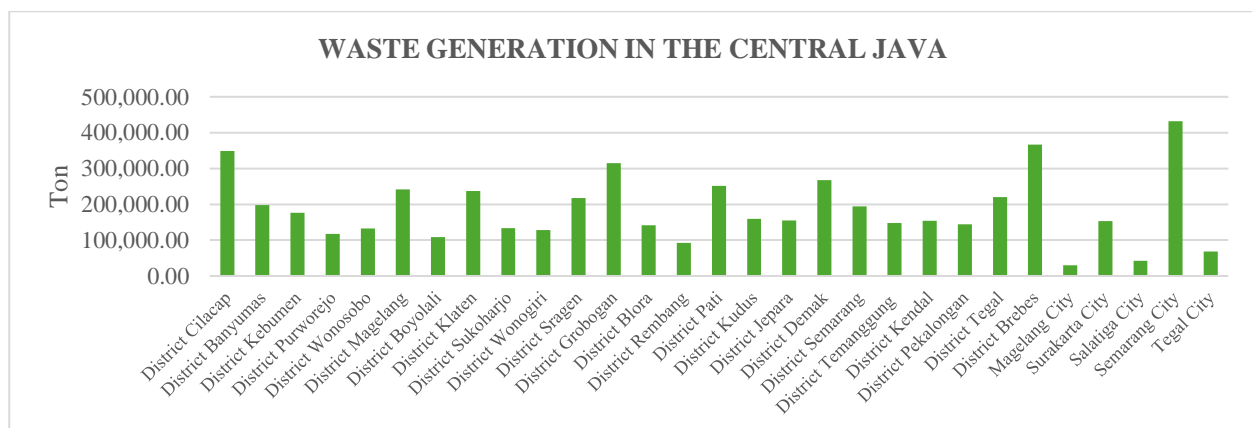


Figure 1. Waste Generation in the Central Java

Source: SIPSAN, 2023

Semarang as the capital of the province of Central Java is ranked at the top in terms of waste generation (see figure 1). Besides they create pollution, social health problem, global warming, damages on the ecosystem and flood, higher consumption of transportation resources and waste management, wastes can also increase disposal and health costs (Ferdinan, 2024). This is a common problem for a big city such as Semarang having high density of population of 1,694,740 people (BPS, 2023). As each person produces 0.7 kg wastes daily, the total wastes will then be many.

Figure 2 presenting the composition of waste in Semarang shows that the biggest waste was food wastes in which the majority of them came from the households.

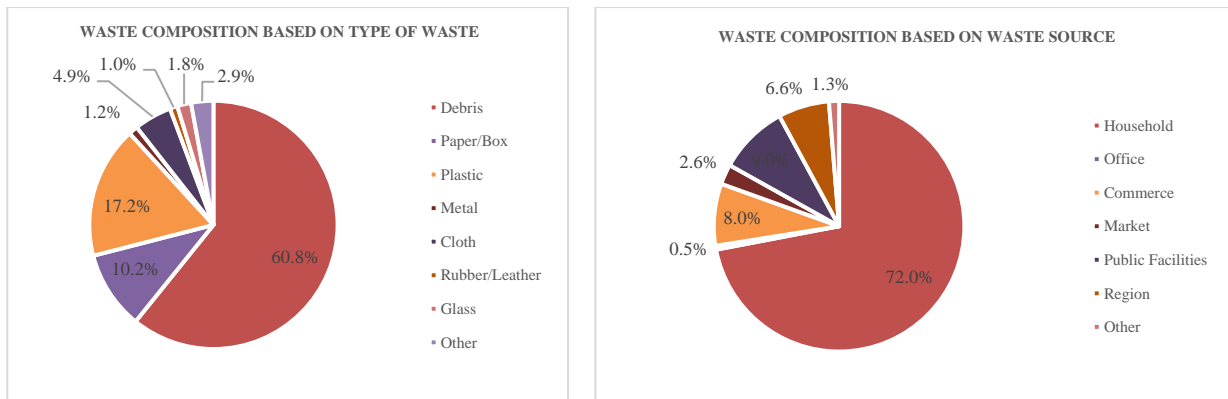


Figure 2. Composition of Wastes in Semarang Based on Type and Source

Source: SIPSN, 2023

Food wastes are the biggest waste produced in Semarang. This indicates that food waste has not yet been managed well that makes the left-over food is just thrown away without being processed further.

Based on its types, wastes are divided into several, such as debris, paper/box, plastic, metal, cloth, rubber/leather, and glass (Amasumo & Baird, 2016). According to the source, majority of wastes in Semarang come from households. This type of waste has not been managed well yet and people still ignore to reuse and recycle things considered as wastes (Akeju & Omotoso, 2023; Ferdinan, 2024; Kisakye Jackie Kiboigo, 2017; Supriyadi et al., 2000). This has created big pile of wastes in the waste dumps. The pile will be getting higher without waste management and it will create bad impacts on the human ecosystem. Furthermore, it will be piled up in the final dump located in Jatibarang (Hasthi et al., 2023).

To minimize the negative impacts of wastes such as health of the society, global warming, ecosystem damage and flood that can increase transportation costs and health costs, it is considerably important to manage waste by building waste bank and implementing of 3R (*Reduce, Reuse, Recycle*) approach (Samadikun et al., 2023). There are waste banks in some regions of Indonesia as the mean to reduce wastes (Ragiliawati & Qomaruddin, 2020; Soepeno & Kinantya, 2023). Waste bank is also implemented in Semarang as a way to minimize waste problems in the city. It has been available in almost 16 municipalities in Semarang.

Only few articles discuss leadership in waste management. The discussion is more likely about waste management in general and does not yet address particular type of management such as waste bank (Kisakye Jackie Kiboigo, 2017; Lodan et al., 2022). Through their research, Eka et al., (2023) showed an effort to reduce wastes is by involving participation of the society to effectively establish waste bank. They however did not address the leader who is responsible for sustaining the waste bank and what is the leadership style. Based on the background of this research and the results of the previous studies, the problem relates to type/style of leadership conducive to effectiveness of managing waste bank in the city of Semarang. Thus, this research aims to identifying leadership style that is effective for managing wastes in Semarang. This aim is also relied on (Rachman et al., 2020; Ragiliawati & Qomaruddin, 2020; Zorpas et al., 2021) stating that lack of leadership role leads to ineffective waste management. However, they did not yet address leadership style effective for waste bank management.

LITERATURE REVIEW

WASTE AND HOUSEHOLD WASTE

Waste is an integral part of human life. Many people think that a useless thing is waste and thus needs to be discarded. Dijkema et al., (2000) emphasized that people are even willing to pay for discarding their rubbish.

It is important to define what waste is. The definitions of waste are found in previous research.

According to the Ministry of Environment and Forestry of the Republic of Indonesia, waste is solid residue resulted from the daily activity and natural process (Jufri et al., 2023; Sari, 2016). Ifyalem and Jakada, (2023) give similar but more detail definition. They stated that waste is daily stuff discarded by the people that include durable goods, perishable goods, boxes and packages, left-over food, and any inorganic wastes. Referring to the Law Number 18 Year 2008, waste generated from the activities in a household excluding faces and specific rubbish is defined as household waste.

SUSTAINABLE WASTE MANAGEMENT

Accumulation of wastes has created problems locally, nationally, and internationally and thus waste handling and management are needed in the local, national, and international (Mudalkar, 2022). According to the Ministry of Environment and Forestry, waste household management is a systematic, comprehensive, and continuous activity covering reduction and handling wastes in the households (Ratnawati, 2018).

Waste management is defined as approaches and procedures that are planned and applied to identify, control, and handle wastes from production to discarding (Vallero & Shulman, 2019). Waste management in developing countries is different from that in developed countries. In the developed countries, the waste management is by applying technology and thus more wastes can be

handled. However, in the developing countries, it still has limitation and has not been able to handle the accumulated wastes (Eka et al., 2023).

In their paper, Kalonde et al., (2022) stated that appropriate waste management can significantly help to attain sustainability development goals (SDGs). According to Vallero & Shulman, (2019), sustainability refers to fulfilment of need to do tasks and activities efficiently dan productively that are beneficial for the doers and do not give negative impacts to the environment in terms of economic, environment, and society.

Cheng et al. (2022) stated that managing household waste includes collecting, transporting, and processing wastes. Because household wastes is a global problem, circular economic and recycling must be promoted. In Indonesia, an effort to deal with this problem is waste bank aimed at reduce production of wastes (Abdussalam & Rahmat Gunawan, 2023; Eka et al., 2023; Ragiliawati & Qomaruddin, 2020).

WASTE BANK

Waste bank is a place where wastes are handled by collecting and separating. Waste separation eases the wastes to be recycled according to their types and to be sold (Putri et al., 2023; Soepeno & Kinantya, 2023).

Waste bank is one good alternative for managing wastes. Using the method of 3Rs (*Reuse, Reduce, Recycle*), waste bank can contribute to handling waste problem and help in increasing people awareness in creating clean, health, and neat environment (Samadikun et al., 2023).

Besides reducing wastes, waste bank is also one way to increase the economic condition of the people (Wulandari et al., 2017); (Putri et al., 2023). This is in line with Friedberg & Hilderbrand, (2017) who stated that waste bank is operationalized as public space bank used to collect trashes of people in the area for having additional income generating from the trash. Ragiliawati & Qomaruddin, (2020) viewed that waste bank is a service for waste depositors by the teller of the waste bank. People in the society, individually or in group, are the depositors of waste and are served by the waste bank personnel.

LEADERSHIP

Leadership style is views, principles, and belief of a leader on how to lead and influence people (Bond, 2015). The role of a leader in ensuring that the organization performance is good is important. Good motivation, appropriate work environment, suitable compensation, and efficient communication between the leader and the subordinates have important role (Buwah et al., 2024).

There are several leadership styles influencing the dynamic, productivity, and culture of an organization or a group in different ways. *First*, transformational leadership style gives energy to the team and share the organization's vision; combine empathy, enthusiasm, and appreciation; support the team members to reach the goals; explore new ideas and increase results; and inspire the members to go beyond their personal interests, have influence on the team members by delegating responsibilities and new jobs for the members grow and maximize their performance (Bond, 2015); (Buwah et al., 2024). *Second*, transactional leadership style uses reward and punishment to motivate and direct the subordinates toward the importance of structure, organization, supervision, performance, result, value, order, and system (Bond, 2015); (Buwah et al., 2024). *Third*, autocratic leadership style indicated by the control of all decisions by the leader. An autocratic leader is rarely accept subordinates' ideas or team consensus. The leader makes decision without participation of the subordinates and thus the decision process is relatively fast. (Bond, 2015); (Buwah et al., 2024). *Fourth*, laissez-faire leadership style delegates authority to the team and trust them to find the best way to do their jobs and achieve the goals. In other words, the leader has the attitude to belief the team to use their creativity, resources, and experience to help others in achieving their purposes (Bond, 2015); (Buwah et al., 2024). *Fifth*, charismatic leadership style is a leader that inspires and motivate the subordinates by his charm and attractiveness, quality, vision, persuasive communication. If the leader inspires loyalty and strong commitment, the subordinates will be motivated to work toward the vision and goals of the leader.

This results in high enthusiasm and energy; increases work motivation, and motivates the subordinates to go beyond their expectation (Bond, 2015). *Sixth*, situational leadership style is a flexible leadership adjusting to the needs and specific ability of the disciples or groups, emphasizes ability of the leader to assess the situation, adjusts leadership approach by giving supports and mentoring, and maximizes performance of individuals or team (Bond, 2015). *Seventh*, servant leadership style focuses on meeting others' needs and emphasizing welfare and development of the subordinates. The leader aims to support and empower the subordinates to reach their full potentials while reach the organization's goals (Bond, 2015). *Eighth*, speed determination leadership style is when the leader determines high standard of performance for themselves and the subordinates, leads by giving examples, shows superiority and expects the subordinates meet the same, has strong motivation to attain goals, and tries to make continuous improvements, is able to lead the subordinates to attain the expected goals, encourages the subordinates to give their best and motivates them to struggle in attaining superiority and continuous improvement (Bond, 2015). *Ninth*, democratic leadership style shows democratic way of thinking, commitment, and responsibility toward the welfare of the subordinates, respects team's opinions, proposes majority of the decisions to be discussed that make the team is respected, encourages all members to collaborate and participate in the process of making decisions (Buwah et al., 2024).

Good leadership in managing wastes is expected to encourage people to participate actively. An effective leader can inspire people to participate in waste management programs through waste bank.

RESEARCH METHODS

This research was conducted in the city of Semarang and covered 16 regencies. Survey was used to collect information on individuals’ responses to the questions. It is a quantitative research that uses questionnaire to collect data (Nandan, 2010; Ponto, PhD, APRN, AGCNS-BC, AOCNS®, 2015) from 177 households as the respondents. Households are considered as the biggest supplier of wastes in the city of Semarang (Becerra et al., 2021); (Ayu, Safitri Dika, 2023).

Stratified random sampling was the sampling technique, a technique to select samples which involves selection of some items from the population based on classification and random selection (Firmansyah & Dede, 2022; Iliyasa & Etikan, 2021). Here, the population of the research was divided into strata of villages and one respondent was taken randomly from each village. The respondents were either the head or the member of a household participating in the waste bank established from the community initiative. The questionnaire was distributed to the respondents in the form of Gform.

The instrument for data collection is the questionnaire developed from previous research, i.e (Azhar & Yang, 2022; Bond 2015; Buwah et al., 2024). They were selected because they can support this research as the reference for creating the instrument.

Accordingly, 14 question items were summarized as follows:

QUESTION ITEM

1. A leader is needed for successful of the waste management programs.
2. Ability to adjust waste management policies to the new conditions.
3. Able to inspire and motivate people to continuously improve the waste management system.
4. The leader listens actively the others’ aspirations and facilitates development of the potencies of the waste management team.
5. Leadership that encourages innovation in handling waste problems, communication with the team is good.
6. A leader who does not block communication in relation to waste management.
7. The leader is persistent and consistent in conducting waste management program.
8. The leader is able to encourage people to find creative and innovative solutions in managing wastes.
9. The leader is open to recommendations on managing wastes from people, maintain communication with all parties involved in waste management.
10. The leader who maintain communication with all parties involved in waste management.
11. The leader has and communicates his clear vision on waste management.
12. The leader gives supports to people involved in waste management.
13. The leader involved directly waste management activities.
14. The leader gives appreciation on positive contribution made by an element of society involved in waste management.

The data analysis started with variable determination comprising leadership and waste management. The instrument to collect data was questionnaire. Here, the respondents were asked to give their perception on the aspects of leadership in managing wastes using 5-point scale of Likert to indicate agreement and disagreement with 1 strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree. The collected data were analyzed using statistic descriptive.

RESULT AND DISCUSSION

IDENTITY OF THE RESPONDENTS

The respondents were 177 heads or members of the household having responsibility in managing the wastes in the household. They were dispersed among 16 regencies in Semarang city. The demographics of the respondents are as follows:

Table 1. The Distribution of the Respondents’ Demographic

Age (year)	45 – 55
Education	SMA/SLTA/MA/Package C and Bachelor/S1
Occupation	Entrepreneur and private staff

Source: Primary Data, 2024

ANALYSIS AND DISCUSSION

Majority of the respondents (88.1%) had experience in managing the household’s wastes, 75.1% stated that there is a person who will have responsibility to manage the wastes in their area in the future. In general, the respondents were identified as having good knowledge on managing wastes and on availability of a person in charge in their area. Referring to the knowledge and experience of the respondents, it can be stated that this research has used the respondents appropriate to the research theme.

The analysis on the role of leadership resulted in the mean of 4.55 which means that the respondents highly agreed that a leader is needed to make waste management to be succeeded. On the other words, a driving leader is needed for the success of a waste management program in Semarang. This results is supported by (Rachman et al., 2020; Ragiliawati & Qomaruddin, 2020; Zorpas et al., 2021) stating that the success of waste management programs depend heavily on the leader who drives the programs.

Leader perceived by the respondents is the one who has the following characteristics:

First, he/she must be able to adapt the policies. The calculation resulted in the mean of 4.26 which means that the respondents agree on the statement. In particularly, the respondents' perception toward a driving leader is a leader who can adapt and apply policies in waste management effectively according to the needs and the conditions in Semarang (Azhar & Yang, 2022).

Second, he/she is able to give inspiration. Indicated by the value of mean 4.36, most of the respondents are agree that a driving leader is a leader with ability to direct the members to attain the goals. Having clear vision, he/she communicates with his/her members and make them to participate actively in managing wastes. This is in line with the research of (Awaale A. A, 2024; Azhar & Yang, 2022; Boeske, 2023; Buwah et al., 2024; Chen et al., 2018)

Third, the respondents agreed (mean 4.37) that a leader listens the aspirations of the members actively and facilitates the development of the waste management team potencies. This can be stated that a leader who can listen the aspirations is needed. He/she is a leader who must actively listen and considers the members' opinions when making decisions in relation to the waste management (Buwah et al., 2024).

Fourth, the respondents disagreed (mean 2.13) on the statement that a leader does not stimulate innovations in handling waste problems. This indicates that a driving leader must be the one who can stimulate innovations. In particularly, it means that the leader must give supports on the implementation of innovative solutions on managing the wastes (Azhar & Yang, 2022; Li et al., 2022).

Fifth, the result on leader characteristics related to communication barriers on wastes issues shows the mean 3.18 which indicates that the respondents agreed on the statement. It can be stated that the barriers occur during the communication with the leader on the waste issues was not the focus of the respondents residing in Semarang. Referring to the pre-survey, it is thus reasonable as the role of a leader in waste management has not yet optimum (Debrah et al., 2022).

Sixth, according to the result, a leader expected by the respondents is the one who is open-minded and consistent in running waste management programs in Semarang. The respondents showed agreement on this statement which is indicated by the mean of 4.07. This also means that the leader is a leader showing commitment in managing wastes in Semarang by implementing strategic actions. Even though many challenges may be encountered, the leader keeps his/her commitments on the strategies by for example creating waste banks that educate people to sort the wastes (Moradi Korejan & Shahbazi, 2016; Chen et al., 2018).

Seventh, with the mean 4.12, the respondents indicated an expectation that the leader must be able to motivate people to find creative and innovative solutions in managing wastes. On other words, the leader creatively prioritizes solutions that can create new ideas for improving ways to managing wastes and is able to thoughtfully finding efficient and effective waste management solutions as stated by (Azhar & Yang, 2022; EFFIYANTI et al., 2021; Chen et al., 2018).

Eighth, indicating by the mean of 2.22, it shows that the respondents disagreed on the statement the leader disregards people's suggestions in managing wastes. It can be stated that the respondents expect a leader who considers people's opinions on how to manage wastes. It also means that the leader must not only rely on his/her opinions but also on people's suggestions as the inspirations in making decisions (Buwah et al., 2024).

Ninth, the respondents' perception on the statement the leader maintains open communication with all parties who are involved in the waste management resulted in agreement with the mean 4.12. This indicates that the leader is expected to have an open communication with his/her members. The leader must be transparent in communicating the decisions, the policies, and the relevant developments to the members with no hidden information (Bond, 2015).

Tenth, the respondents agreed (mean 4.16) with the perception that a leader who has vision and communicates a clear vision on future waste management in Semarang. The result shows that a leader must have a clear vision on waste management such as creating Semarang as a free waste city by for example implementing an efficient waste management organized through waste banks. Such vision must be communicated to the community so they can participate in managing the wastes (Chen et al., 2018).

Eleventh, the respondent showed negative opinion by disagreeing the statement (mean 2.20) a leader rarely supports the community in managing wastes. This indicates that the respondents expect a driving leader is that who accepts suggestions and supports the members revealed from his/her willingness to allocate time to praise and respect the members' ideas and opinions, and to give assistances and resources needed in managing wastes (Awaale A. A, 2024; Azhar & Yang, 2022).

Twelfth, the respondents disagreed (mean 2.20) with a leader who never involve in waste management activities. They expect a leader must not only producing policies but also involve actively in the implementation of waste management by for example motivating people and ensure that the waste management programs run well and sustainable (Chen et al., 2018).

Thirteenth, the respondents agreed (mean 3.90) with a leader who gives appreciation on the community's positive contributions to waste management programs in the area of his/her responsibility. A concrete action that can be done by the leader is to support the erection of waste banks in each municipality and give rewards to a successful waste bank (Stocker et al., 2014).

This analysis provides valuable insights for decision makers and leaders in waste management (waste bank) to understand the leadership dynamic and its impacts on the effectiveness of the waste management (waste bank) program (Moradi Korejan & Shahbazi, 2016).

Variety of the responses indicate variety of the opinions that is possibly influenced by the respondents' differences of experience or point of view. This is reasonable since the respondents were varied in age, educational background, and occupation.

In the context of transformational leadership, the results address the importance of a leader who inspires, motivates, and listens to the team/members. According to (Azhar & Yang, 2022; Bond, 2015; Buwah et al., 2024; Moradi Korejan & Shahbazi, 2016), the leaders must focus on developing innovation and giving proper supports to the society involved in managing wastes (waste bank).

CONCLUSION

The results of this research underlines the importance of leadership on the success of waste management (waste bank) programs, that also in line with the finding of Ragiliawati & Qomaruddin, (2020).

The results also show that the respondents had positive view on leadership in waste management (waste bank). In particularly, they viewed that a leader with the transformational leadership style who wants to adapt, listen, and inspire will be more effective in coping with the challenges in waste management (waste bank) (Awaale A. A, 2024).

However, specific attention must be put on the aspect of management innovation for the waste management (waste bank) programs to develop and be successful.

RECOMMENDATIONS

1. A leader with transformational leadership style must accentuate leadership type expected by the members/people in managing wastes (Awaale A. A, 2024).
2. This research can be a reference for similar research cultivating different aspect such as variables or area of research.
3. The limitation of this research is on the aspect of leadership role and type needed to the success of the waste management (waste bank). As the role of stakeholder was not studied, it can thus be the focus of future research.

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