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Community Participation in Solid Waste Disposal of People in Dusit District, Bangkok

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Peer Review Information	Abstract
<p><i>Submission: 21 Jan 2025</i> <i>Revision: 20 Feb 2025</i> <i>Acceptance: 15 March 2025</i></p> <p>Keywords</p> <p><i>Participation</i> <i>Solid Waste Disposal</i> <i>Decision-making</i> <i>Implementation</i> <i>Benefit-Sharing</i></p>	<p>This research aimed to study the level of participation, compare differences in participation, and examine recommendations for promoting public participation in solid waste disposal in Dusit District, Bangkok. This quantitative research employed a sample of 400 residents in the Dusit area. Data were collected using questionnaires and analyzed using basic statistics, t-test, and one-way ANOVA.</p> <p>The findings revealed that the overall level of community participation in solid waste disposal was high, with significant participation in decision-making, implementation, benefit-sharing, and evaluation, respectively. Residents with different gender, age, income, and information perception showed significant differences in their participation in solid waste disposal, while educational level, occupation, and household waste generation showed no differences.</p> <p>The researchers recommend promoting learning and knowledge dissemination about waste management, encouraging community participation through various activities such as establishing recycling centers and waste banks, supporting relevant policies and legislation, and building networks with environmental conservation groups.</p>

Introduction

Waste is a problem that has occurred alongside human life from the past until the present. Daily activities, whether cooking, consuming, or using various items, create unwanted waste materials. When waste is discarded and accumulated without proper management, it causes environmental problems, is a breeding ground for germs and disease vectors, and affects public health and the orderliness of the city (Narong Na Chiang Mai, cited in Nares Muangrungs, 2002). The current waste problem has become more severe, especially during the COVID-19 pandemic, even though single-use packaging

waste has shown a downward trend. However, the proportion of improperly disposed waste is increasing (Phiraphong Klinchat, 2016). This problem is caused by many factors, including industrial development, tourism promotion, and people's consumption behavior.

Government and private agencies still face problems with waste management processes and methods that do not meet standards, resulting in the accumulation of various types of waste in public areas, water sources, and ecosystems. One problem is the illegal dumping of industrial waste, which causes environmental pollution and public health (Ministry of Natural

Resources and Environment, 2019). Effective waste management requires community participation through four key processes: waste reduction, waste collection system management, wastewater reduction, and community environment improvement (Wichaya Chumsuwan, 2014). This research aimed to study the participation of people in waste disposal in Dusit area, Bangkok, to understand the form of waste management in the community, the role of the government sector, and the level of people's participation in solving the waste problem.

Objective

- 1 Study the level of participation in waste disposal in communities of people in Dusit District, Bangkok.
2. Comparison of differences in participation in waste disposal in the community of people in Dusit District, Bangkok, classified by personal factors.
3. Study recommendations for promoting participation in waste disposal among people in Dusit District, Bangkok.

Research Methodology

This research is quantitative research that aims to study the level of public participation in the process of waste disposal in the community. A questionnaire was used as the main tool for data collection and data analysis using descriptive statistics and inferential statistics to answer the research objectives. The details of the research methodology are as follows:

Research Design: This research is quantitative research using a questionnaire as the main tool to collect data from a sample group of people in Dusit District, Bangkok. This research aims to study the participation in solid waste disposal in the community of people in Dusit District, Bangkok, emphasizing the use of related theories and research, such as the theory of public participation (Arnstein, 1969) and research on solid waste management in large cities (Zurbrugg, 2002).

Population and sample: The population used in this study was people living in the Dusit area, Bangkok, totaling 75,538 people (Dusit District Office, 2024). The sample group used in the research was 400 people in Dusit area, using the stratified random sampling method according to the population structure in the area, which was obtained by calculating the sample size using Taro Yamane's (1967) formula.

Research variables: Independent variables are personal factors, including gender, age, education level, occupation, average monthly income, type of household waste, and news perception. The dependent variables are

participation in community waste disposal of people in Dusit District, Bangkok, which is divided into 4 aspects: decision-making, operations, benefit receipt, and evaluation.

Research instruments: The research instruments were questionnaires, which were divided into 3 parts as follows: (1) a personal information questionnaire, including gender, age, education level, occupation, and average monthly income; (2) a questionnaire on participation in solid waste disposal in the community, consisting of 20 items, divided into 4 dimensions (5 items per dimensions) using a 5-level ratInstrument Quality Check: Content Validity: Calculated from the Index of Item-Objective Congruence (IOC) by 3 experts, it was found that all questions had an IOC value of more than 0.50, which indicates that the questionnaire has content validity (Kanlaya Wanichbancha, 1997; Taherdoost, 2016) and Reliability: The questionnaire's reliability was found using Cronbach's Alpha coefficient, which was equal to 0.954, indicating that the questionnaire has high reliability.ing scale; and (3) an open-ended form questionnaire to allow citizens to express their opinions on problems and suggestions in solid waste management.

Data collection: The steps are as follows: selecting a sample group according to the specified criteria, coordinating with supervisors and informants to explain the purpose and method of data collection, distributing questionnaires to the sample group of 400 sets, and allowing respondents to answer the questionnaires independently, collecting the questionnaires by themselves, and checking the accuracy of the data before analyzing them.

Data Analysis: Descriptive Statistics is used to analyze general basic data of the sample, including Frequency, Percentage, Mean, and Standard Deviation. For Inferential Statistics, Independent t-test is used to analyze the difference between the means of 2 sample groups, and One-way ANOVA is used to compare the means of more than 2 sample groups. If a statistically significant difference is found, a pairwise test will be performed using Fisher's Least Significant Difference (LSD) method.

Literature Review Or Research Conceptual Framework

The study of public participation in waste disposal in the community is an issue that has received much attention in academic and environmental management circles. Since waste is a major problem that affects the environment and people's quality of life, public participation is an important factor that will help increase the efficiency of waste management sustainably. In this research, the researcher reviewed the

literature related to the independent and dependent variables to create a research conceptual framework as follows:

Concepts and theories of public participation Participation is a process that allows the public to participate in various operations or activities, from thinking together, finding problems, planning together, making decisions together, taking action together, receiving benefits together, and participating in monitoring and evaluating the results. The public can participate either individually or in groups, with willingness and freedom to express their opinions. Participation is an important factor that will lead to community development that truly meets the needs of the public because it makes the public feel ownership and commitment to the project or activity (William Erwin, 1976; Cohen & Uphoff, 1981).

Participation theory consists of several important concepts, including the theory of persuasion that uses communication to build trust and acceptance, the theory of morale building that focuses on creating a sense of responsibility towards the community, the theory of leadership development that focuses on developing leaders who are capable of motivating and coordinating, the theory of using a management system that relies on rules and decentralization to promote participation, and the theory of motivation that takes into account human needs. These theories share the common goal of promoting effective participation, in terms of creating understanding, creating motivation, developing leaders, and organizing a management system that is conducive to participation, in order to create cooperation in development and achieving common goals (Prasert Sinthuthai, 2007).

Participation consists of 4 main important steps: 1) Participation in decision making, starting from problem identification, prioritization, and joint planning; 2) Participation in operations by jointly providing resources, management, and coordinating activities; 3) Participation in receiving benefits, both direct and indirect, both in quantity and quality, with fair distribution of benefits; and 4) Participation in evaluation, so that stakeholders can express their opinions and satisfaction with the operations. Participation can occur both directly and indirectly through representatives or committees (Cohen & Uphoff, 1977, 1981; Fornaroff, 1980).

Concepts and theories about personal factors

Personal factors are characteristics of each individual that influence behavior, attitudes, and decision-making in various situations. Many scholars have defined and given various perspectives on these factors. Kotler and

Armstrong (2022) explained that personal factors are characteristics of individuals that directly affect behavior and decision-making, including age, gender, occupation, education, income, marital status, and lifestyle. All of these reflect differences in lifestyles and needs of each individual. At the same time, personal factors are an important element that reflects individual differences in behavior, decision-making, and work efficiency. Many scholars have defined and given various perspectives on these factors. Schiffman & Kanuk (2007) explained that personal factors consist of identifiable information about an individual, such as age, gender, education, occupation, income, religion, and ethnicity, all of which influence an individual's behavior in various situations, especially in the context of work and participation in community activities. Similarly, Siriwan Sereerat (2020) mentioned personal factors as important and measurable demographic characteristics of the population, pointing out that these factors play a key role in determining the target market and are easier to measure compared to other variables, such as attitudes or emotions, which can be more complex. In addition, Thompson and Roberts (2023) added that personal factors are variables used in market segmentation and determining consumer behavior, as they are basic characteristics that affect an individual's decision-making process and lifestyle.

In addition, Chattayaporn Samojai (2007) divided personal factors into two main characteristics to clearly understand the structure of these factors. The first is biosocial characteristics, which are characteristics that are innate, such as gender, age, and race. These characteristics tend not to change and are factors that determine physical and biological differences between individuals. The second is social-cultural characteristics, which are factors that can change according to the environment, such as income, education, occupation, and family structure. These characteristics reflect the roles and relationships of individuals in the society and culture in which they live. Priyaporn Wong-Anutroj (2010) added that personal factors have a significant impact on work performance, especially in work that requires specialized skills and expertise. Individuals of different ages, genders, education, and experiences tend to exhibit different behaviors and work abilities. For example, children may not be suited for jobs that require heavy physical labor, while adults with previous work experience are often skilled in specific tasks. Gender also plays a factor in determining the type of job that is suitable for an individual; for

example, certain jobs may require physical strength, in which case males may have an advantage.

From the synthesis of the above concepts and theories, it can be concluded that personal factors are important elements that reflect differences between individuals in many dimensions, including biological, social, and cultural aspects. These factors not only influence behavior and decision-making in daily life but also play an important role in determining the ability to work or participate in various activities, such as community waste management, which is an important issue in this research. A deep understanding of personal factors is therefore the key to designing strategies and measures that effectively respond to the needs and differences of the target group.

Waste Management Concepts And Theories

Waste management concepts emphasize the importance of public participation in all processes, from decision-making, operations, and benefit acquisition, to evaluation (Cohen & Uphoff, 1977), which helps increase efficiency and create responsibility in the community. Effective waste management requires a waste management hierarchy that emphasizes waste reduction from the beginning. Such as reduction and reuse before final disposal (Fornaroff, 1980). Comprehensive policy planning, such as waste separation at the source and hazardous waste management, are important factors that help reduce environmental impacts and promote sustainability. Therefore, effective waste management requires an integrated approach that combines public participation and clear public policies to lead to sustainable development in the long term.

Public participation is an important factor that directly affects the efficiency of waste management because the waste management process depends on the behavior and cooperation of people in each community (Cohen & Uphoff, 1977). Participation can be divided into several levels, such as decision-making on waste policy, cooperation with relevant agencies, and providing feedback to improve the management process (Fornaroff, 1980). In addition, personal factors such as knowledge, attitudes, and motivation of people affect the level of participation. It was found that those who know waste management tend to participate more in waste separation and waste reduction activities, which is consistent with the environmental behavioral concept that emphasizes that behavior change requires both knowledge factors and social support (Ajzen, 1991).

In practice, effective waste management requires consideration of people's factors along with appropriate policy planning (Schultz et al., 1995). Effective strategies often focus on educating people about the impacts of improperly managed waste, creating incentives through economic incentives, and promoting behavior through participation in community activities. If governments and relevant organizations can design policies that are consistent with citizens' behaviors and motivations, it will help make waste management systems more efficient and sustainable, reflecting the complex relationship between citizens' participation, individual factors, and waste management approaches that must work together to achieve sustainable environmental goals (Cohen & Uphoff, 1981).

Research Results

The research on "Participation in Waste Disposal in the Community of People in Dusit District, Bangkok" has the following results:

1. Study the level of participation in waste disposal in the community of people in the Dusit area, Bangkok. The results are as follows:

The study results found that people in Dusit District, Bangkok, participated in the community's solid waste disposal at a high level ($\bar{x} = 4.22$, S.D. = 0.646), which reflects the community's awareness and strong participation in solid waste management. When considering each aspect, The results showed that people participated at a high level in four dimensions: (1) participation in decision-making ($\bar{x} = 4.24$, S.D. = 0.692), which meant participation in determining the community's waste management policy or guidelines; (2) participation in operation ($\bar{x} = 4.18$, S.D. = 0.727), which represented actual practice, such as waste separation and proper disposal; (3) participation in receiving benefits ($\bar{x} = 4.25$, S.D. = 0.675), which was related to receiving benefits from the project, such as improved environment; and (4) participation in evaluation ($\bar{x} = 4.22$, S.D. = 0.757), which represented expressing opinions on the project results and proposing improvements. The data reflected that people's participation was an important factor that could help make waste management in Dusit more efficient and sustainable.

2. Comparison of differences in participation in waste disposal in the community of people in Dusit District, Bangkok, classified by personal factors. The results are as follows:

Table 1 Participation in community waste disposal of people in Dusit District, Bangkok, classified by personal factors.

Number	Hypothesis	Accept	Refuse
1	People of different genders participate in waste disposal in communities in Dusit District, Bangkok differently.	ü	
2	People of different ages participate differently in waste disposal in the Dusit community, in Bangkok.	ü	
3	People with different educational levels participate differently in waste disposal in the Dusit community, in Bangkok.		ü
4	People with different occupations participate in waste disposal in the Dusit community, Bangkok differently.		ü
5	People with different income levels participate in waste disposal in communities in Dusit District, Bangkok differently.	ü	

Source: From research results^{vi}

3. Study the recommendations for promoting participation in waste disposal of people in Dusit District, Bangkok. The results are as follows: From the research results on public participation in waste disposal in the community, Dusit District, Bangkok, it was found that the public participated at a high level. However, to enhance the efficiency and sustainability of waste management in the community, there should be additional guidelines as follows:

1. Promote learning and disseminate knowledge. There should be training or activities to provide knowledge about correct waste management methods, such as waste separation, waste reduction at the source, and waste recycling, with an emphasis on enabling people to use the knowledge to disseminate and create awareness of waste management together within the community.
2. Promote community participation in waste management. There should be projects that encourage public participation, such as setting up waste banks or recycling points, to create incentives for waste separation and reduce the amount of waste in the community. In addition, cooperation between government agencies, the private sector, and the public sector should be supported to systematically manage waste.^{vi}
3. Support related policies and laws. Citizens should play a role in monitoring and supporting the implementation of government policies related to waste management, including pushing for stricter and more effective measures, such as enforcing laws on waste separation and reducing plastic waste.

4. Monitoring and evaluating performance. Progress of measures and projects related to waste management in the area should be monitored, including providing opportunities for the public to make suggestions or adjust the implementation guidelines to be appropriate for the community context.
5. Create networks and cooperation with environmental conservation groups. People should be encouraged to participate in environmental activities with various conservation groups to create an effective waste management network, including the exchange of good practices among communities.

Discussion Of Research Results

1. The results of the research on objective 1 found that people in the Dusit area, Bangkok, participated in the disposal of solid waste in the community at a high level ($\bar{x} = 4.22$, S.D. = 0.646). When considering each aspect, it was found that people participated at a high level in all 4 aspects: participation in decision-making ($\bar{x} = 4.24$, S.D. = 0.692), participation in operations ($\bar{x} = 4.18$, S.D. = 0.727), participation in receiving benefits ($\bar{x} = 4.25$, S.D. = 0.675), and participation in evaluation ($\bar{x} = 4.22$, S.D. = 0.757). This is because public participation in each area reflects awareness and understanding of the impact of solid waste on the environment and quality of life, which is the result of efforts by the government and communities to raise awareness through campaigns and education activities, such as waste separation training, community waste reduction projects, and support for citizens to play an important role in determining waste management policies and guidelines. In addition, the clear distribution of benefits, such as a cleaner environment and better health, is an important motivation for

people to participate in these processes. This is consistent with the concepts, theories, and research of Cohen & Uphoff (1977) who proposed that public participation in decision-making, implementation, benefit receipt, and evaluation are important factors leading to the success of community development projects. It is also consistent with the research of Zhang et al. (2018) who found that public participation in solid waste management activities can increase the efficiency of operations and create long-term sustainability. In addition, Miezah et al. (2015) stated that public participation in all stages of waste management, from planning to evaluation, will enhance community responsibility and ownership, which are important factors for project success.

2. The results of the research on the second objective found that the participation in the disposal of solid waste in the community of people in Dusit District, Bangkok, is different when classified by personal factors. The results of the study can be summarized as follows:

1. People of different genders participate differently in waste disposal (accept the hypothesis), which may be due to the social and cultural roles that place women more responsible for housework and household waste management than men (Ojeda-Benitez et al., 2017).
2. People of different ages have different participation in waste disposal (accept the hypothesis), as older population groups tend to have more time and availability to participate in community activities, while younger population groups may have higher environmental awareness but have time constraints (Zhang et al., 2018).
3. No difference in participation in solid waste disposal was found between people with different education levels (rejected the hypothesis), which may reflect that education is not the only factor affecting waste management behavior and may depend on other factors such as information exposure or motivation from the community (Wilson & Tisdell, 2006).
4. No differences in participation in solid waste disposal were found between people with different occupations (rejecting the hypothesis), which may indicate that occupation does not have a direct impact on participation in community activities (Chen & Wu, 2019).
5. People with different income levels participate differently in waste disposal (accept the hypothesis), as higher-income groups tend to have more resources and access to efficient waste management

services, while lower-income groups may face economic issues that limit their participation (Miezah et al., 2015).

This is because personal factors such as gender, age, and income influence people's behavior and ability to participate in community activities, which is consistent with the concept of Schiffman & Kanuk (2007) who stated that these factors are important variables that determine individuals' behaviors in various situations. This is consistent with the research of Ojeda-Benitez et al. (2017) who found that gender affects participation in household waste management activities, Zhang et al. (2018) who pointed out that age affects environmental behavior, and Miezah et al. (2015) who confirmed that income affects the ability to access effective waste management services.

3. The results of the study on recommendations for promoting public participation in waste disposal in Dusit District, Bangkok, found that although the public participated at a high level, it is still necessary to increase the efficiency and sustainability of waste management through additional support methods, such as learning and disseminating knowledge about waste management, motivating communities to participate, and supporting relevant policies and laws (Knickmeyer, 2020). Organizing training or activities that focus on waste separation and waste reduction at the source can effectively enhance public awareness. In addition, establishing projects such as waste banks or recycling points will help create incentives and reduce the amount of waste in the community (Scheinberg et al., 2010).

Citizen participation in decision-making and evaluation processes is a key factor for the long-term success of waste management. Arnstein's (1969) concept of the "Ladder of Citizen Participation" states that high levels of participation, such as joint decision-making and evaluation, will increase transparency and trust in the project. In addition, support for policies and laws, such as the enforcement of laws on waste separation and plastic waste reduction, will increase the efficiency of operations (Zurbrugg, 2002). Creating a network of cooperation between the government, the private sector, and the public sector is another strategy to make waste management systematic and sustainable.

Monitoring and evaluating the implementation, including providing opportunities for the public to express their opinions and improve the implementation approach, are important to make the project suitable for the community context (Pretty et al., 1995). Creating a network

of cooperation with environmental conservation groups also helps to enhance the exchange of good practices among communities and create cooperation in effective waste management, which will lead to sustainable waste solutions in the future (Wilson & Tisdell, 2006).

Conclusion

The research results found that people in Dusit District, Bangkok, participated in the community's waste disposal at a high level, with strength in all 4 main aspects: decision-making, operation, benefit receipt, and evaluation, which reflected the people's awareness and cooperation in waste management. Personal factors such as gender, age, and income influenced participation behavior, while education and occupation did not show any clear differences.

The approach to promoting participation should focus on learning and disseminating knowledge about waste management, such as sorting and reducing waste at the source, including setting up projects such as waste banks to create incentives. In addition, supporting policies and laws, such as enforcing waste sorting measures and creating a network of cooperation between the government, private sector, and communities, will help make waste management systematic and sustainable.

SUGGESTIONS

From the research results, it was found that people in the Dusit area, Bangkok, participated in waste disposal to a high level. However, there is still an opportunity to increase the efficiency and sustainability of waste management. There should be operations in many areas to enhance long-term success.

Suggestions from the research

1. Knowledge and awareness building: Training activities or campaigns should be organized to provide knowledge about waste management, such as waste separation, waste reduction, and waste recycling, with an emphasis on disseminating information that is easy to understand and appropriate to the community context.
2. Motivation and participation: Establishing programs such as waste banks or awarding prizes for those who contribute to waste management can help encourage people to see the value of participation. In addition, creating a network of cooperation between the government, private sector, and communities will help make operations systematic and sustainable.

3. Policy and legal support: Enforcement of laws on waste separation and plastic waste reduction will help increase the efficiency of waste management. In addition, there should be regular monitoring and evaluation of operations to adjust the guidelines to suit the needs of the community.

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