Changes community behavior in management of household waste in Bekasi City, Indonesia

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Abstract. Changing people's behavior is the main thing in household waste management. This paper examines people's behavior and the factors that influence behavior change in household waste management in their homes. The research was conducted by conducting a study of household waste management in Bekasi City, West Java Province, Indonesia, because it has heterogeneous community characteristics and a city with the most enormous waste generation in the world. Research focuses on indicators that include the perception, participation and acceptability of the community to influence people's behavior in managing household waste in their homes. This study examined 548 members of the waste bank using a questionnaire to determine community behavior in household waste management. Based on the research results, it is known that the perception, participation and acceptability of the community are correlated with the quality of household waste management. Furthermore, community behavior changes can be carried out by increasing community perceptions, participation, and acceptability in household waste management.

1. Introduction

The development of urban areas must be balanced with changes in community behavior in household waste management in their respective homes [1][2][3][4]. Change people's behavior in the management of household waste is a significant side of the implementation of waste management should be in the priority right to realize the management of sustainable household waste [5][6]. To realize sustainable household waste management, a household waste management strategy is needed that involves all stakeholders [7][8].

Social aspects influence community behavior changes in managing household waste: community perceptions and participation in managing waste in their homes [9][10]. In addition to pursuing technical programs towards changing people's behavior in managing household waste, management programs and appropriate methods for managing waste are also needed in realizing sustainable household waste management [11][12].
Along with the growth dynamic urban areas accompanied by the growth of the city’s population and the activity of urban communities with all the necessary dynamics of sustainability ability to anticipate the negative impact of urban activities on the environment [13]. The development of urban areas leads to changes in the natural environment, the use of natural resources is greater, the increase in air pollution, and the amount of volume of waste caused by the population's growth. Population growth is one of the causes of environmental problems in the City Area [14]. However, that population growth does not come into one's vision. Kan only cause changes in the environment. The development of economic, socio-cultural and civilization activities determines changes and environmental conditions in cities. The speed of population growth that cannot be followed by the ability to facilitate it causes environmental problems. To overcome the environmental problems in urban areas it is necessary to have a smart city system [15].

Waste management at the city scale has been carried out through regulatory efforts by issuing Law Number 18 of 2008 on Waste Management and education efforts accompanied by community elements' socialization. However, it must be understood that it powerfully illustrates the characteristics and generation of waste generated from the process population lifestyles and abundance of natural resources owned concerning the municipal waste. The final processing site that when this very far short of expectations as it has been mandated by the Law of the Republic of Indonesia Number 18 of 2008, that the handling of waste in the landfill must use the sanitary landfill and regional governments must close the landfill that uses an open dumping system no later than 5 (five) years since the enactment of Law Number 18 of 2008. However, it seems that the regulation is ignored by the Regional Government, which is 90% of the landfill in Indonesia conducts open dumping in handling its waste [16].

The strategy in controlling household waste is needed to optimize the steps of waste management efforts that have been carried out by the Government, the Community and other stakeholders, to reformulate the potential and challenges faced in managing household waste, especially at the scale of the urban community. Households that are the most significant potential source of waste generation can be the primary target for waste reduction [17]. Understanding the sources and types of waste and the existence of data on the amount of waste generation and its composition, forms the basis and formulates and manages waste [18].

Bekasi City is one of the largest Metropolitan Cities in Indonesia, having a fast-growing population growth rate. The growth rate is quite large compared to the national scale, which reached 1.47%. Population growth in Bekasi is moving fast, partly due to the development of housing development and other facilities, which has caused the city of Bekasi to become an investment destination city [19]. Population growth and development of the Bekasi region with all its people's activities and activities have caused various environmental problems that must be faced. One of the problems that are still a significant problem for Bekasi is the problem of waste management that can meet the community's wishes, is environmentally friendly and can be operated properly, so that it becomes a sustainable waste management system. That increasing urban population, changing lifestyles, changing diet and increasing the welfare and living standards of urban communities cause massive amounts of waste in Metropolitan Cities [14].

This research focuses on people's behavior in managing household waste in a scaling community of urban. The locus of research is the city of Bekasi level waste problem is quite complicated and Terca tat as the city with waste generation world. In Bekasi City there are 2 (two) landfills (TPA), namely Sumurbatu landfill that collects waste originating from the Bekasi City community with a volume of garbage reaching 1700 tons per day and TPST Bantargebang which collects trash originating from the people of DKI Jakarta with the volume of waste reach 8000 tons per day. Thus, if it is calculated per day, Bekasi City receives around 9700 tons per day, causing the mounting garbage to fill the landfill site in Bantargebang.

Based on Bekasi City Environmental Agency (2019), it is known that the percentage of waste management in Bekasi City has only reached 58.67 %, with the details being managed, namely transport waste 39.79% and 18.88 % managed by 3R. The composition of household waste, which is
dominated by organic waste, is one of the potential educational and utilization objects. Because household organic waste, which accounts for 60% of the total waste, can be managed optimally so that it does not need to be disposed of in a garbage bin [19]. Inorganic waste households may also economic value. There is Part of inorganic waste has a value that can be managed for recycling and deposited into the Waste Bank [20]. Organic waste and inorganic waste can still be managed so that it does not need to be disposed of because organic waste can be used as plant fertilizer and inorganic waste can have economic value or can be recycled.

In a community-based approach, households receive awareness-raising sessions on managing their food better—initiator, Waste and Resource Action Program (WRAP). Even though the results are based on data collected qualitatively, they show very positive results, noting that the project's communal nature led to its success. An essential factor that was mentioned was that participants felt empowered to solve problems regarding the self-development of their knowledge and skills in food waste. Factors to be considered to manage household waste urban areas, such as the extent of perception, participation, and acceptability of society on the pattern of household waste management and measures that enhance awareness of the importance of managing household waste in each community. Based on the results of similar studies, there is a significant relationship between knowledge and behavior, a significant relationship between attitudes and behavior, and a significant relationship between subjective norms and behaviors that influence household waste management behavior. That the influence of the research mentioned above factors can influence household waste management's behavior by 25.4% [9].

The topography of the residential area influences community perceptions related to waste management. The flatter the location of a region's residence, the better the waste management level [21]. Community perception related to waste management has a positive correlation with managing household waste [22]. Research on perception also states that people's perception of waste is very influential in their environment. People who have positive perceptions of waste management will not cause environmental pollution. In contrast, people who have negative perceptions about waste will not care about their behavior and pollute the environment [23].

Community participation in waste management is influenced by the characteristics of the community and the residential environment. The factors that influence community participation in waste management include education, income, yard area, environmental conditions, attitudes towards the environment and community perceptions [24]. Community participation in waste management in waste management is simultaneously influenced by community understanding, willingness and income [25].

Acceptability in marketing terms is defined as a measurement of the extent to which the number of the company's product offerings meets and exceeds customers' prices in the target market. Acceptance has two dimensions: 1) Functional acceptability, which is indicated by factors such as core attributes and abilities, functions, ease of use, quality, and reliability. 2) Acceptability psychologically is shown factors such as image (reputation, positioning, personality), styling, social value, emotional value, and the perceived risks. The acceptability of moving from products to customer and object values, for consumers value is a significant point. Customer value refers to the benefits a customer will get from a product or service against costs incurred. So monetary measures are needed to estimate product benefits that can be spent on each other. Object means something that consumers buy to meet their needs [26].

In addition to society's knowledge, attitudes, and subjective norms, the influence of the information strategy on minimizing household waste can also affect people's behavior in managing household waste. With the intervention strategy in promoting household waste management, it can increase the number of motivated people to carry out independent waste management in their homes. However, based on studies related to waste management to reduce environmental problems, households not only have to sort the waste but also to be done also attempt minimalizing pile of garbage as a whole, and more effectively implemented at the source of waste that is at their respective homes [27].
Implementation of guidance and education to the community continuously and consistently is expected to form a culture of good environmental behavior and be a supporting factor in the drive to realize behavior in household waste management. Whereas the specific and general environmental activation substantially influences the community's behavioral intentions in managing household waste, including the behavior of sorting garbage in the household. Rapid economic growth and urbanization have resulted in various urban problems associated with sustainable development. Continuous increases in household waste have become a significant concern throughout the world, while waste segregation has been considered an effective waste reduction method. However, the low level of participation in household waste recycling is generally accepted in almost all countries. The findings indicate that general and specific environmental motivations substantially influence behavioral intentions. Besides, the direct effect and the moderation effect of contextual factors on waste sorting behavior is significant. Habitual factors also have a significant influence on behavior [28].

2. Method
This research was conducted in Bekasi City, which has 210.49 km² with 2,431,480 people based on the 2018 Central Statistics Agency Data. Bekasi City is one of the City in West Java Province which is directly adjacent to DKI Jakarta Province which has a geographical location of 106 ° 48’28” – 107 ° 27’29” East Longitude and 6 ° 10’6” – 6 ° 00’6” South Latitude. Bekasi City area generally classified in a dry climate with humidity levels are low, with condition everyday environment is scorching. Things are influenced by land use increased, especially regional trade and settlement. Daily temperatures are estimated to range between 24 – 33 °C. Of the total area of Bekasi City more than 50% has become a significant urban area with 90% of a residential area, 4% of an industrial area, 3% of the trade area, and the rest for other buildings [29].

In this study, primary data was collected, carried out by direct data collection using a questionnaire. It was clear that the community's behavior and activities in carrying out household waste management were expected to identify existing problems [30]. Through questionnaires, information from respondents will be extracted and analysis will be carried out using correlations related to perceptions, participation and acceptability of household waste management patterns. Furthermore, the study will analyze the extent to which efforts to control household waste management in organic, inorganic and residual household waste are compared to the potential waste in the community.

This study's population was 8384 households registered as members of the Bekasi City Waste Bank [18]. The research was conducted by examining household waste management patterns that have been applied to an urban community scale. The sampling method used was an electronic questionnaire using a google form, distributed through the Whats' Apps application, because the Covid-19 pandemic was happening. Hence, it was not possible to conduct interviews and field observations. After being verified based on the incoming electronic questionnaire data, it was determined that the number of respondents in this study was 548 households registered as members of the Garbage Bank in Bekasi City. In the final stage, the data obtained were analyzed using SPSS 22.0 software by performing a Correlation Test between perception, participation and acceptability as various factors that influence household waste management behavior. This research is also expected to provide recommendations on government policies with related stakeholders that can be carried out to support changes in community behavior in managing household waste independently.

3. Results and Discussion
Based on the results of research on community participation in household waste management, it is known that data is obtained that the community’s perception of household waste management is that 69% of respondents already know about the importance of household waste management. With the public perception of waste management, there will be an intense interaction with the environment, as has been conveyed by [31] that the public perception of household waste management, a process
involving the entry of messages or information into the brain of human thought, so that through human perception it is continuously in contact with the environment.

Based on the correlation test analysis of the variable community perceptions in household waste management, it can be concluded that the Significance Test or Sig. (2-tailed) between the variable community perceptions of household waste management of 0.009, it can be interpreted that it is correlated or a significant relationship between the variable public perception of household waste management. The value of the correlation coefficient between the variable community perceptions of household waste management is 0.111, it means that the correlation or the relationship between people's perceptions of waste management is weak. The value of the Correlation Coefficient is positive, it means that the relationship between the variable community perceptions of household waste management is unidirectional, thus an increase in community perceptions increases the quality of household waste management.

**Table 1.** Table of Correlation Test for community perceptions of household waste management

| Spearman's rho | Community Perception | Waste Management |
|----------------|----------------------|-----------------|
| Correlation Coefficient | 1.000 | .111** |
| Sig. (2-tailed) | . | .009 |
| N | 548 | 548 |

| Waste Management | Correlation Coefficient | Community Perception |
|------------------|--------------------------|----------------------|
| Correlation Coefficient | .111** | 1.000 |
| Sig. (2-tailed) | .009 | . |
| N | 548 | 548 |

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Table Correlation test using the SPSS 22.0

As for the results of research related to community participation in household waste management, it is known that the percentage of respondents who have participated in carrying out household waste management is 51%. Thus, more than a part of the community has participated in carrying out household waste management independently in their respective homes due to a reasonable perception regarding household waste management.

Community participation in household waste management can be seen from daily behavior or habits that support household waste management efforts. Based on the results of the research, it is known that the behavior or habits of the community as much as 38% of the community have made efforts to manage wet waste from food / organic waste independently in their respective homes, as many as 54% of the people have made waste management efforts by sorting dry/plastic / inorganic independently each house, as many as 41% of the community has sorted between organic waste and inorganic waste and as many as 25% of the community has made efforts to recycle dry waste/plastic (inorganic).

Based on the correlation test analysis of the variable community participation in household waste management, it can be concluded that the Significance Test or Sig. (2-tailed) The variable community participation in household waste management of 0.001 can be interpreted as being correlated, or there is a significant relationship between the variable community participation in household waste
management. The value of the correlation coefficient between the variable community participation in household waste management is 0.170, it means that the correlation or relationship between community participation in waste management is weak. The value of the Correlation Coefficient is positive. It means that the relationship between the variable community participation on household waste management is unidirectional. Thus increasing community participation results in an increase in the quality of household waste management.

**Table 2.** Table of Correlation Test for community Participation in household waste management.

| Spearman's rho | Community Participation | Waste Management |
|----------------|-------------------------|-----------------|
| Community Participation | Correlation Coefficient | 1.000 | .170** |
| Sig. (2-tailed) | . | .001 |
| N | 548 | 548 |
| Waste Management | Correlation Coefficient | .170** | 1.000 |
| Sig. (2-tailed) | .000 | . |
| N | 548 | 548 |

**. Correlation is significant at the 0.01 level (2-tailed).**

Source: Table Correlation test using the SPSS 22.0

Furthermore, based on the results of research related to the community's acceptability of household waste management, it is known that only 17% of respondents stated that the community had voluntarily carried out household waste management independently or on a community scale. This is possible due to society's low psychological acceptability towards social values, emotional values, and perceived risks in household waste management.

Based on the correlation test analysis of community acceptability variables in household waste management, it can be concluded that the Significance Test or Sig. (2-tailed) between the variable acceptability of society to household waste management of 0.004, it can be interpreted that it is correlated or there is a significant relationship between community acceptability variables to household waste management. The value of the correlation coefficient between the public acceptability variable towards household waste management is 0.123; it means that the correlation or the relationship between community acceptability in waste management is weak. The value of the Correlation Coefficient is positive. It means that the relationship between community acceptability variables to household waste management is unidirectional. Thus increasing community acceptability results in an increase in the quality of household waste management.

**Table 3.** Table of Correlation Test for community Acceptability of household waste management.
**Spearman’s rho**

| Community Acceptability | Correlation Coefficient | Sig. (2-tailed) | N   |
|-------------------------|--------------------------|-----------------|-----|
|                         | 1.000                    | .123**          |      |
| Sig. (2-tailed)         |                          | .004            | 548 |
| N                       |                          | 548             |      |

| Waste management        | Correlation Coefficient | Sig. (2-tailed) | N   |
|-------------------------|--------------------------|-----------------|-----|
|                         | .123**                   | .004            | 548 |
| Sig. (2-tailed)         |                          | .              | 548 |
| N                       |                          | 548             |      |

**. Correlation is significant at the 0.01 level (2-tailed).**  
Source: Table Correlation test using the SPSS 22.0

4. **Conclusion**

Based on the research results related to household waste management in Bekasi City, changes in community behavior can be carried out by increasing community perception, participation, and acceptability in household waste management. Furthermore, it is hoped that it can become a recommendation in household waste management by the Government and related stakeholders in realizing changes in community behavior in sustainable household waste management.

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