

# The Government Organizational Determinants on Solid Waste Management in Bandung City, Indonesia

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## Abstract

This study aims to analyze the application of governance management in the waste processing of Bandung City. Data were collected through interview, observation and documentary study, and were analyzed through qualitative technique. It is argued here that application of governance management can be seen from the aspects of leadership, human resources, managerial skills and external supports. This study finds that the application of these factors is still hampered by the inability of the leaders to communicate the organizational policies to the staffs, low level of human resources, managerial skills that are not supportive, limitedness of working tools and support from the community. To improve the effectiveness of solid waste management in Bandung city, it is recommended here the capacity development for the employees, improvement of working tools, increase in budget by the city government, and promotion of community good attitude in treating solid waste through the practice of reducing, recycling and reusing of garbage.

**Keywords:** Organizational Factors; Government Management; Solid Waste Management; Bandung City

## 1. Introduction

With the increasing population, rapid industrialization and booming economic activities, many metropolitan areas in the world are currently experiencing an increasing problem of waste management. While the responsibility to waste management in many countries is held by district or city government, their performance in solid waste management is often low. Solid waste management becomes a serious challenge for many city governments in developing countries due to the increasing generation of waste, limited budget, difficulty to adopt newest technology, and low attitude of community.

The complexity of solid waste management in metropolitan areas has attracted many scholars to analyze it and to recommend policies needed to improve. There have been several studies analyzing the waste management, among others are the study by Lee and Huang (2007) in Taipei, Jin and Chen (2008) in Guangzhou, as well as Lei and Wang (2008) in Macao. The studies find that the application of newest technology in waste processing can substantially increase the performance of city government in managing solid waste. The technology of waste management is mostly works in the end of waste processing, especially by improving the sorting of waste, reducing the quantity in disposal places, as well as utilizing the waste as an alternative sources of energy. The main limitation of the existing technologies is that they are difficult to be adopted in many developing countries due to limited budget to procure or install as well as limited capacity to operate them.

In Indonesia, Muliawaty (2010) finds that the waste management is generally not effective, creating low satisfaction from the public to the government. Several studies find that the problems of waste management lie on not only the weak technology but also weak management and community culture. For example, Hasim (2007) finds that the government cannot optimally manage the waste due to weak organizational capacity. Muhafidin (2006) finds that waste management requires high cost if it is only implemented by the government agencies, thus a city government should develop cooperation with the neighboring local governments, and consider waste as trans-district issues. Cooperation with the neighboring districts is important, as it is fund by Bustomi (2006), that the un-comprehensive spatial planning in the city undermine the availability of infrastructures as well as accessibility of waste transportation throughout the city. Another study by Hadis (2008) finds the importance of community empowerment to help the effectiveness of waste management. He recommends that the government involves community in managing the waste, especially by promoting discipline in garbage dumping and re-using.

From the perspective of government theory, waste management is one of the main tasks of government.

The management should be implemented based on a public policy by the designated institution. Effectiveness of waste management will be influenced very much by many factors of government organization. This study aims to contribute to the literature as well as help to formulate recommendation by analyzing the government organizational factors in solid waste management. To do so, it will focus on one of metropolitan city in Indonesia, namely Bandung city. This is basically a qualitative research, in which data are collected through interview, focused group discussion and observation. Fieldwork of this study was conducted simultaneously from 2014 to 2016.

The next chapter is organized as follows: Section 2 makes literature reviews; Section 3 analyzes results and discussion by presenting the socio economic character of the study sites, the operating procedures of solid waste management, and the government organizational factors applied in the management; Section 4 draws conclusion and recommendation.

## 2. Literature Review

Philosophically, one of the main tasks of the government is to provide public service for the community. The concept and strategies to provide public services are always changed overtime in order to pursue the highest satisfaction of the public. The idea of New Public Management has emerged in 1980, which recommend the government to focus to the outcomes instead of program outputs. Osborne and Gabler (1992) seriously recommend the bureaucracy all over the world to finance only the programs with clear outcomes, through the concept of Result-Oriented-Government (ROG).

The concept of Total Quality on Government Management (TQGM) developed by Cohen and Brand (1993) presents that the management within government organization is unique compared to the private organization. The concept presents that government is an instrument for carrying out the will of the people. Public officers have the obligation to serve the interest of the public with economic and efficiency concerns.

Whatever the tasks of the government, according to Watson and Hasset (2003), there will be always some organizational factors influencing the performance of government. The organizational factors include:

1. Leadership, which underlines the ability of key actors to initiate, organize and direct a strategic effort;
2. Human Resources, which underlines the ability of supportive individuals to help make important decisions and implement necessary programs and policies;
3. Managerial Skills, which underlines the ability to establish effective control over management process and provide analytical support for strategic efforts;
4. External Support, which underlines the ability to satisfy external demands on the organization with limited disruption of internal process, the willingness of external actors to provide vigorous support for decisions made as a part of the strategic process, and the financial means to handle the costs of developing a strategic effort.

Solid waste management, as one of the main task of city government, will be influenced very much by the organizational factor as mentioned before. Those factors have substantially covered the internal dimension of bureaucracy, which includes Leadership, Human Resources and Managerial Skill, as well as the external factor of bureaucracy reflected by the degree of support from its environment. Together, those organizational factors will be used to develop the conceptual framework of this study (See Figure 1)

Figure- 1. Conceptual Framework of the Study

## 3. Results and Discussion

### 3.1. General Description of Bandung City

Bandung is the capital city of West Java Province. The number of population in Bandung city was 2,394,873 people in 2015. The average of density at 14,316 person per square kilometer, while the growth rate of population was at 1,81% annually, averagely. The high number of population and economic activities in the city imply to the high quantity of garbage produced by the city. The city generates 7,500 cubic meters of garbage per day, averagely. Most of them, 66%, are generated by households. While the city generates huge quantity of solid waste, it is only 52% of them that can be managed by the designated agency (Table 1).

Table 1 Generation of Solid Waste in Bandung City

No.	Source of Solid Waste	Quantity of Solid Waste (cubic meters per day)		
		Generated	Managed by the City Government	Unable to be Managed
1	2	3	4	5
1.	Households	4,951	2,853	2,098
2.	Traditional markets	618	384	234
3.	Modern markets	302	220	82
4.	Streets	465	291	174
5.	Industry	798	158	640
6.	Public facilities	363	144	219
<b>Total</b>		<b>7,500</b>	<b>4,050</b>	<b>3,450</b>

Source: Fieldwork, 2015

### 3.2. The Procedures of Waste Processing

The city of Bandung has made a public policy to regulate solid waste management, through Local Bill 9/2011 on Waste Management. Solid waste management is carried out by a specially established organization, namely PD Kebersihan, literally means Local Enterprise of Cleaning. The operational cost of PD Kebersihan comes from revenues generated from his services and the budget allocated by the city government. The bill obliges the residents to sort garbage into organic and non-organic ones, and to throw them only in the designated places. It is the tasks of PD Kebersihan to transport the waste from temporary to the final disposal places.

The procedures of waste processing in Bandung city starts from cleaning, collection to temporary disposal places and delivery to final disposal place (Figure- 2).

Figure- 2. Procedure of Solid Waste Management in Bandung

#### 1. Cleaning

The cleaning is done by the waste generator directly, in which the waste is thrown into recycle bin. The sorting of waste into organic and non-organic ones is done in this stage. In the street and other public facilities, the cleaning was done by the employee of *PD Kebersihan* between 05.00 AM to 11.00 AM and 11.00 PM to 17.00 PM. The tools used to clean include broom, open basket and container with the capacity of 120 liters. There are totally 224 km of street and various public facilities that should manually be cleaned by 572 street cleaners.

#### 2. Collection to the Temporary Disposal Places

The waste generated from households, traditional and modern markets, street and other public facilities are collected to designated temporary disposal places by using cart, three wheel vehicle, and wagon. There are currently nineteen Temporary Disposal Places for Solid waste in Bandung City.

#### 3. Transportation to the Final Disposal Places

The waste from temporary disposal places is transported to the final disposal place by using truck. The schedule is once a week. Especially for the waste generated by Industry, it is transported directly without being collected in temporary disposal places. The final disposal place of solid waste from Bandung city is located in the village of Sarimukti, West Bandung District. The average of time needed to transport the waste from Bandung city to the location is about 3-4 hours.

### 3.3. The Organizational Factors

#### 3.3.1. Leadership

The structure of organization of PD Kebersihan consists of 15 leadership posts, which should organize the daily management of the organization. The main director, which holds the highest position in PD Kebersihan, was screened and selected by the major and parliament of Bandung city.

Leadership is organizational factors emphasizing on the ability of key actors to initiate, organize and direct a strategic effort. In the other words, leadership can be seen from the ability to utilize the existing resources to achieve the stated objectives.

Such efforts to improve the performance of PD Kebersihan are by making Memorandum of Understanding (MoU) between the PD Kebersihan and industries as well as modern markets. The MoU underlines commitment of industry and modern markets to ensure that the sorting of the generated waste is properly conducted. It also establishes commitment to follow the schedule of waste transportation as accordingly, as well as the period of dues payment. The MoU is expected to improve the management of solid waste as well as financial capacity of PD Kebersihan. While PD Kebersihan can promote MoU with industries and modern

markets, it still cannot establish MoU with neighborhoods as the largest generator of waste. The main reason is that neighborhoods are not systematically organized as a legal entity.

Another strategic effort to improve the performance of PD Kebersihan was conducted through the installment of new machine in waste processing. However, it is found that the application of new technology is still limited. In the recent years, it is only the procurement of the pressing machines, which function to press the amount of waste. A package of sorting machine is installed, but it does not optimally work due to the weaknesses in the used technology.

The last strategic efforts made by the leadership of PD Kebersihan is by promoting the practice of 3R (Reduce, Reuse, Recycle) to the community. PD Kebersihan has a target to decrease the volume of solid waste by 20% through practice of 3R. The promotion of 3R was performed with the cooperation with the chiefs of sub-districts and wards in Bandung city. The chiefs and PD Kebersihan are trying to facilitate the establishment of community group to manage the waste in their neighboring. Up to the data collection, it is recorded only seven neighborhoods in Bandung city having established a community group to apply 3R. This means that efforts to promote the practice of 3R should be boosted by PD Kebersihan.

### 3.3.2 Human Resources

Currently, there are totally 1,582 employee of *PD. Kebersihan*. Most of the employees are the street cleaner (45%), driver/shipping (21%), dues collector (10%), and waste processor in the Final Disposal Places (6%). Especially for the street cleaner, a system of work-shift is applied by making 50% of street cleaner works from 05.00 AM to 11.00 AM, and the rest 50% works from 11.00 PM to 17.00 PM.

According to the head of PD Kebersihan, the number of employees is still not enough to conduct the tasks of solid waste management in Bandung city. He illustrated that with the existing number, the ratio of cleaner to the length of main street is only 3 : 1. This ratio is deemed unable to make the city clean from the waste, especially during the waste-peak season like National Independence Day, New Year, and city carnivals. During that days, all of the employees of PD Kebersihan works to collect the waste. In the calculation of the director of PD Kebersihan, it is needed an additional 387 personel, which mostly consists of street cleaners and shipping man (Table 2).

Table 2. The Existing Number and the Need for Additional Operational Employees of *PD Kebersihan*

No	Type of Jobs	Number		
		Existing Number	Ideal Number	Needs for Additional Employees
1	2	3	4	5
1	Driver/Shipping man	365	490	125
2	Street cleaners	714	950	236
3	Final Waste Processers	24	50	26
	Total	1,103	1,490	387

Source: Fieldwork, 2016

Some efforts to improve the capacity of the employee have been done by training. However, the training is given only to the operator of waste processing machine. In 2015, there have been 40 staffs given this kind of training.

Efforts to improve the performance of employees in solid waste management are conducted by applying reward and punishment towards the employees. In term of rewards, there have been bonus of salary given every year, and allowance of health, condolence, and housing. In term of punishment, there have been 91 of letters of warning given to the indiscipline employees in 2015.

### 3.3.3. Management Skills

The factors of managerial skills emphasizes on the ability of managers or leaders to establish effective control over management process and to provide analytical support for strategic efforts.

PD Kebersihan has established programs and strategies as well as working targets annually by referring to the policy made by city government. However, it is found that the programs and strategy as well as the working targets are only understood by the leaders or managers level. The programs cannot be communicated to the street level employees due to several technical reasons. The reasons, among others, include difficulty to conduct meeting and the low educational and understanding level of many street level employees.

To convey the program and strategy to the street level bureaucracy, it is therefore, a visit from the director is important to convey the message. While the leaders of PD Kebersihan claimed that they control the employees daily, and check the cleaning of some spot in the city periodically, it is found here that the control of PD Kebersihan is not routinely conducted per day. Accumulation of solid waste is frequently found in the field, especially from the market areas, due to low control from the direction of PD Kebersihan.

### 3.3.4. External Support

External support in an organization emphasizes on the ability to satisfy external demands on the organization with limited disruption of internal process, the willingness of external actors to provide vigorous support for decisions made as a part of the strategic process, and the financial means to handle the costs of developing a

strategic effort.

According to the director of PD Kebersihan, the most important external support needed by the PD Kebersihan was the increase in the budget delivered by the city government. While PD Kebersihan can principally obtain budget from its activities, however, the PD Kebersihan has never can be optimally generate profit. From the financial report of the PD Kebersihan, it is found that the PD Kebersihan frequently suffers from a financial loss (Table 4). During the last six years, it is only in 2011 and 2013 in which PD Kebersihan could generate profit.

Table 4 Financial Report of PD Kebersihan, 2010-2015

No	Financial Data	Year (in million rupiah)					
		2010	2011	2012	2013	2014	2015
1	2	3	4	5	6	7	8
1	Revenues	44,898	63,226	53,004	58,979	61,033	72,519
2	Operational Cost	46,275	52,637	57,902	58,057	62,295	72,535
	Balance	-1,377	10,589	-4,898	922	-1,262	-16

Sumber : Fieldwork, 2016

The city government always transfers some portion of the budget to improve the financial capacity of PD Kebersihan. The salary of the workers, procurement of the working tools and the reparation of strategic facilities in PD Kebersihan could not be conducted unless the city government provides the budget needed.

Another external support needed by PD Kebersihan to maintain the city clean is the creation of community attitude in treating the waste, for example through discipline to throw the garbage only in the designated places, to strictly sort the waste, and to reduce the volume of waste being produced through recycling and reusing method. However, it is found that the community attitude in waste management is not always supported. This can be indicated from the fact that PD Kebersihan always needs additional number of street cleaner. Only if the community has thrown the garbage only in the designated places, then the PD Kebersihan does not need many street cleaners, instead only to transport the waste to final disposal place.

#### 4. Conclusion and Policy Recommendation

Solid waste management has been the challenge for Bandung city, which has delegated the tasks to PD Kebersihan. The organizational factors, which include leadership, human resources, managerial skills, and external supports, are found to be substantial to the performance of city government in solid waste management. Various weaknesses exists in the factors, which ranges from the inability of the leaders to communicate the organizational policies to the staffs, low level of human resources, managerial skills that are not supportive, limitedness of working tools and low support from the community. While several efforts have been done by the PD Kebersihan to improve the leadership, human resources and managerial skill, however, all of them cannot have high impact on solid waste management due to limited external factors, especially with regard to the support from community to discipline in throwing the garbage, in sorting the waste, and in reducing the volume of waste being generated through recycling and reusing methods. The other weaknesses include limitedness of working tools and budget support from the city government. As the impact, the operating procedures being established by the city government cannot be well performed, and the performance of city government in solid waste management cannot meet the expectation of public.

To increase the performance of city government in solid waste management, especially from the view pint of organizational factors, it is recommended here to improve the availability of working tools, to increase the availability of operational cost, increase the number of employees, especially street cleaners, and to promote the creation of community attitude to support waste management through recycling and reusing methods.

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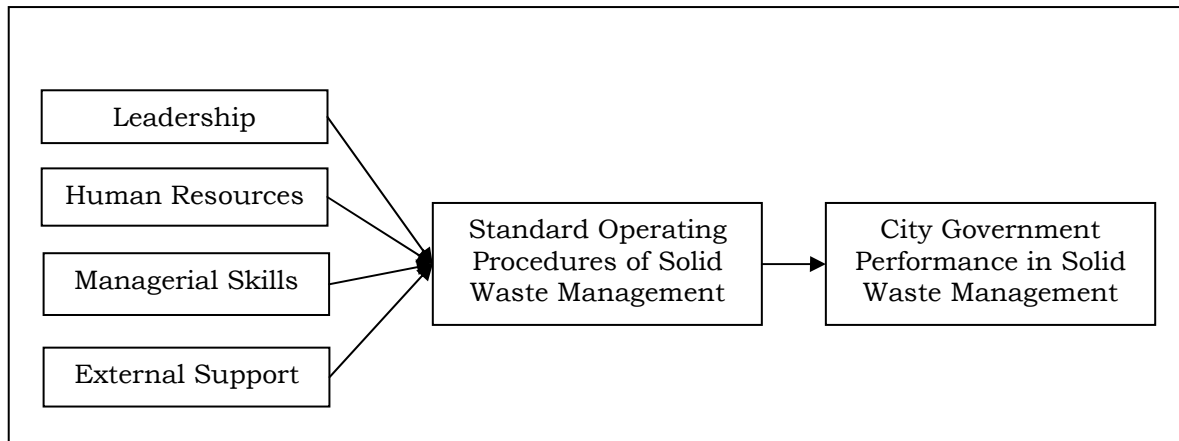


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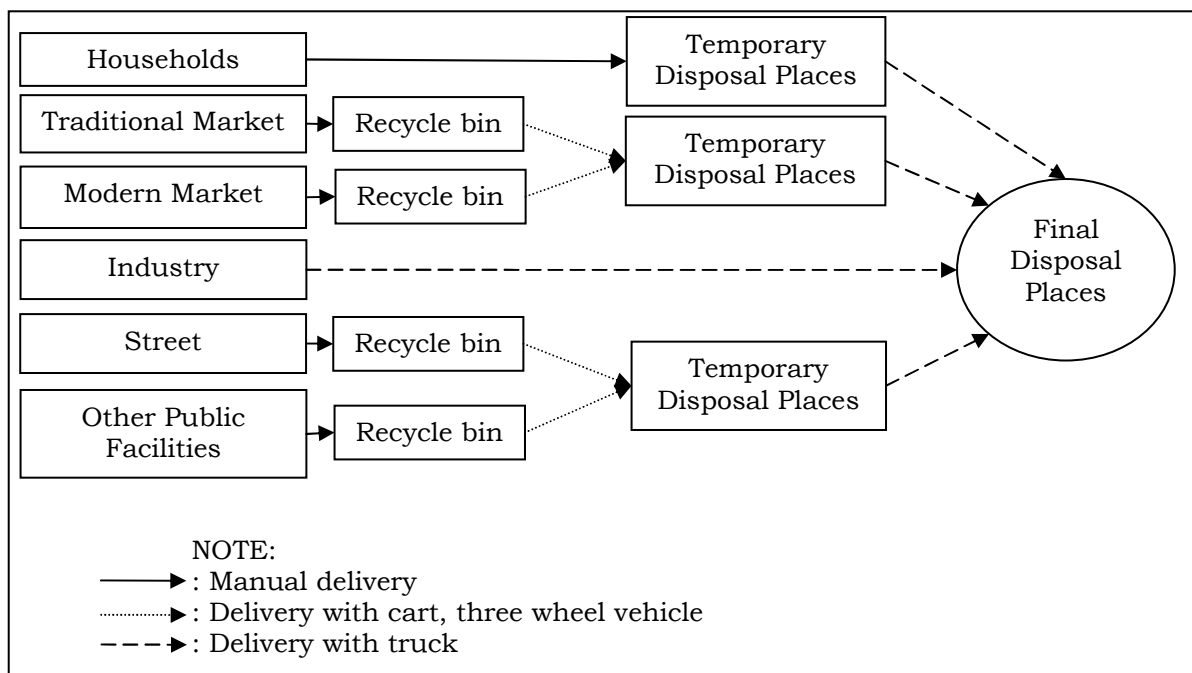
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**Figure- 1**  
**Conceptual Framework of the Study**



**Figure- 2**  
**Procedure of Solid Waste Management in Bandung City**