Waste Management Strategic Planning: Waste Management in Jayapura City

Lazarus B. Ramandey

Cendrawasih University Jayapura, Indonesia

e-mail: geelvancharamandey@gmail.com

Abstract - *This study deals with urban waste management in general by considering key issues in waste management in Indonesia and various problem solving alternatives dealing with waste problem referring to waste management in developed countries (Curitiba). In addition, problems faced will be discussed with the systems approach including: institutional sub-system (sub-system of institutions), operational technique sub-system (sub-systems engineering), financial sub-system, legal and regulatory sub-system (law sub-system) as well as public and private role sub-system. Population growth that is accompanied by high urbanization has resulted in increasingly high volume of waste that must be managed every day. It is increasingly difficult for management and waste management are less than optimal. Similarly, the active role and public awareness as well as the financing are still very low. The system approach can assist in solving the complexity of the problem of waste management by looking at the issues comprehensively.*

Keywords: *urban waste management; population growth; public awareness*

1. Introduction

The increased waste from domestic waste in the cities, is getting worse and giving negative impacts for the environment. There are air, soil and water pollutions has been giving big troubles of inconvenience's living (Moerdjoko, 2002). Therefore, professional handling should have been conducted based on citizenship and it is strategically positioning to be discussed, defined, and implemented. Environmental untimely has been a big issue in almost every city is waste. The high rate of economic growth in the city is soaring of urbanization. Consequently, the city is getting large in population as well as immense of consumption and finally the waste is enormous too (National Standardization Agency, 1992). The large waste doesn't considerate waste management will be a deterioration and environmental pollution (Kustiah, 2005:1). Moreover, waste handling was not comprehensive would trigger social problems such as mass rioting, clashes among residents, and blocking the landfill. Civil society separates the understanding between rubbish and waste. In fact, both are waste, even sometimes it can be used for another purpose. The understanding of rubbish is limited on solid waste, both organic and inorganic, while waste in the process is used water in it (Hadisuwito, 2007). Both is categorized as waste, as well as solid rubbish and liquid waste, which are sources from the people or society, and it is commonly called as domestic waste. The meaning of domestic waste is waste from environment of society, which has form and composite influenced by the culture and its environment. According to the source domestic waste may come from citizen of living, offices, shops, and even from home industry. In relation to its chemistry, domestic waste is divided into 2 groups : (a) inorganic, such as plastics, metals, broken glasses, and dust (b) organic, such as food waste, paper, leaves, fruit and vegetable wastes (Kamaruddin, 2013). On the subject of easily to burn, there are two kinds of wastes: (a) easily to burn (papers, rubbers, plastics, fabrics, and woods). And (b) not easily to burn, but this material is different from easily to decay. The wastes are not easily to decay is plastics, broken glasses, and rubbers, while easily to decay are food wastes, leaves, fabric pieces, and papers.

2. Literature Review

In order to solve the problem concerning waste, there are some ways to conduct, included: (a) determining the policy on waste management , (b) conducting regional waste handling, (c) encouraging people to manage the waste and to concern the waste phenomenon, and (d) increasing the friendly environmental technology.

The issue of waste problematic in Indonesia has been revealed since 1990s. Even though, strategically policy has been determined, is only technical aspects : (a) decreasing of waste by applying 3 R concepts

(Reduce, Reuse and Recycle), with expectation on 2025 will reach "zero waste" (National Standardization Agency, 1992). Although, presently there is a need of strong policy as an umbrella for not only on the Center of Governmental WasteManagement, but also for regional handling.

The waste management in the beginning has been approached by administrative area, and this can be changed regional waste management (National Standardization Agency, 1991). Regional Management approach means that there is a joining some towns and/or regencies on waste management. This is vastly beneficial, because it can reach economically scale on the final waste management, and transportation from regional waste location to final waste location. There are various principal ways can be applied on WasteManagement :

a) To set up the regional policy (PeraturanDaerah=Perda) together with waste management staffs. The rules includes all the points of law, institution, techniques, and financial.

b) Institution strengthening by separating the functions of law makers, operators, and its evaluation and reviews.

c) Determining performance indicator, based on technical aspects, giving the indicators of :
   (1) All the waste should be carried to final waste location within 24 hours
   (2) The technique on waste transportation will not produce bad odor
   (3) The operational of final waste location has been determined by system (for example : landfill sanitary system),
   (4) The beneficial functioning of waste can be economics source by applying recycle process or for compost
   (5) An agreement should be available among regencies/cities (towns) regarding the waste retribution fee will be balanced between government and the citizen's payment.

The development of industry and increased population in year by year, has been raised of waste of industry and citizen, thus it burdens soil, air, and river which flow in entirely town (Bamonti, 2011). The consequence of enlarged population yearly, there is lack of open space can utilized by citizen as well. The volume and sorts of waste depend on the consumption of the citizen from a location. The more income of the citizen, the more volume and sorts of waste will be produced. However, generally, most of waste is organic waste (wet waste) as 60-70 % from total of the waste volume (Ministry of Environment, 2008).

3. Materials and Method

This research is explanatory which aims to test the hypothesis that there is a relationship between the availability of land, transportation, and waste management with the successful of waste management. Variable of research are 4 : the availability of land, transportation, and waste management as free variables and the successful of waste management as dependent variable. The respondent involved is 60 which is proportionally taken by random sampling. Measurement instrument is questionnaires of 16 questions with Likert scales. Data was analyzed by multiple linier regression analysis with software SPSS version 20.

4. Results and Discussion

Characteristics of respondents' education is high school (40%) or S1 (15%). In the cities, elementary and junior high school education is a few. The distinctiveness of respondents by age is mostly respondents with age of more than 50 years (68%), while respondents with age less than 30 years is 32%. The individuality job of respondents are various : employees or labors (33%), household wife (22%), entrepreneur (24%), government officer (16%), professional (5%). The research of regression analysis regarding the influence of land, transportation and waste management with the successful of waste management is illustrated in Table 1 as follows:

Tabel 1. Regression Analysis Result

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	p
1	(Constant)	-2.077	1.580		-1.314	0.194
	X1.Land	0.096	0.129	0.088	0.742	0.461
	X2.Transportation	0.480	0.125	0.414	3.841	0.000
	X3.Management	0.395	0.131	0.391	3.021	0.004

$R^2 = 0.632$, Adj-$R^2 = 0.612$; F = 32.072 (p=0.000)

The regression analysis result showing that there is a significantly connected influence from three free variables toward the successful of waste management by contribution of 63,2%. Regression coefficient is positive means that enough availability of land, sufficient transportation, efficient technique of waste management are supporting the successful of waste management. The more number of three free variables, the bigger of the successful of waste management. The result of partially test of three variables also gave result that two variables are significantly influenced toward successful waste

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management level (p<0.05), those are waste transportation facility and technique of waste management.. Whilst, land variable is not significantly influenced (p>0.05) toward the successful of waste management. Based on standardized coefficient (beta), the number of transportation has the highest coefficient (0.414). This analysis result gives interpretation that the higher of successful waste management depends on the availability of land, sufficient transportation, and good technique of waste management

Waste has been an agenda of problem in almost all cities in Indonesia. The high rate of population with high pressure of urbanization has increased waste of cities gradually. The limitation of cleanliness department ability to handle waste is the beginning point of decreased waste handling system. This difficulty is more suffering of limited of land for final waste location (TPA), the numbers of transportation, and improperly waste management which those are not suitable with the rules of friendly environment.

5. Conclusion

Less caring of waste from government can be seen from the less prepared budget. As the same time as citizen in generally has not showed an indication toward self-sufficient and sustainable waste handling. Regarding on unconsciousness of citizen in waste handling, there is urgent to implement waste handling in formal and informal situation. In this case, available institution is enough but human resources is urgently needed to encourage people to manage their own waste and socialization in importance of waste management. On waste handling, there is a need of enough budget to facilitate the transportation and an opportunity to have training how to efficiently handle the waste.

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