

## REGIONAL WASTE MANAGEMENT PLANNING:

### Case Study : Nambo Site, Bogor Regency

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#### Abstract

Waste as consequences of human activity today gains more attention in Indonesia's Planning field. Not only has the government declared the Act of Waste Management No. 18 Year 2008, but they also has improved many programs relates to the waste management in several province and regencies in order to increase environmental awareness in planning.

West Java Province started in 2006 begin with Integrated Regional Waste Management in four areas in order to solve the problems and minimize the environmental affect.

#### A. Introduction

##### Background

General problems about waste management in Indonesia actually is the conventional system from its cradle to grave. The commonly implemented system is that waste produced from households, industries, commercial area, and others, are collected by transport system and caried out to the final disposal site. The recycling program or the community based development which was introduced in this last five years seemed to increase slightly since it has low attention and rewards from the government.

This conventional system means that there will always a need of huge land to burry the waste, much capital to construct the landfill site, hundreds of waste

transportation vehicle, and the much amount of financing for operational and maintenance.

Similarly in Bogor City, Bogor Regency, and Depok, those local government has faced several problems related to waste management as mentioned in table below :

Table 1  
Condition of Waste Management in Bogor City, Depok City, and Bogor Regency  
Year 2009 (West Java Province, 2009)

No.	Region	Waste Production	Level of Services	Final Disposal Site	Condition
1	Bogor City	457 ton/day	77%	TPA Galuga	Overload
2	Depok City	759 ton/day	21%	TPA Cipayung	Overload
3	Bogor Regency	904 ton/day	10%	TPA Galuga	Overload

It can be clearly seen that those three regions will have no disposal site to process and to burry the waste. As an urban area, Bogor Municipality and Depok has no other suitable place final disposal site. On the other hands, Bogor Regency had prepared a land for final disposal as width as 56 acres in Nambo, Kelapa Nunggal. However, by the act of Waste Management No. 18 year 2008, the government should start to operate the sanitary landfill, not open dumping anymore. By means it needs a huge capital to construct the landfills to meet the need declared in the act.

This planning problems is than take over by the West Java province and stuctured as Nambo Intregrated Waste Management Plan by the agreements with those three local government : Bogor municipality, Bogor Regency, and Depok (Called as Bogor-Bogor-Depok action). The agreements are No. 658.1/1/KEPBER/HUK/2009 about location for final disposal and No. 658.1/2/NK/HUK/2009 about cooperation on final processing of regional waste.

## Problem Statements

Managing waste in a sustainable manner is one of the key challenges for the Region, and one in which every citizen has a role to play. How we manage our waste says a lot about how highly we value our environment. There is consensus that we should minimize impact on the environment; this can be achieved by working to minimize the amount of waste we generate, and managing the waste we do create in the best manner possible. Social and economics problem will rise from unmanaged waste. If waste is managed well, the cost of fixing problems does not become a burden on council finances.

The development of the city will be suffered from the mounting cost of externalities caused by waste problem: enviromental problems and sanitations. These externalities have had negative impact on the liveability and appeal of the city. The waste problems rise because when the cities growth, the inhabitant tend to lack of social responsibility (Brunn & William, 1983 in Pontoh & Kustiwan, 2008). People do not care about public facilities and tend to be individualistic.

## Objectives

This plan purpose to provide the Intregrated Waste Management site for Bogor – Bogor – Depok in Nambo, Bogor Regency using act No. 18 Year 2008 as a basic procedure.

## B. Integrated Waste Management Plan

### Plan Overview

The plan of integrated Waste management Plant is firstly initiate by the West Java Province following the demand of final disposal site in Bogor Regency, Bogor Municipality, and Depok Municipality which is supported by the land provided by Bogor Regency.

The land will be used is belong to Perum Perhutani that is around 100 hectares in Nambo and Lulut Villages, Kelapa Nunggal District, Bogor Regency. It is planned to

accept the waste from Bogor – Bogor – Depok, so that the project included by the transportation network. The plant itself will consist of several areas such as landfills, buffering zones, offices, and the integrated treatment facilities for recycling process.

According to the goals of this planning, this is incremental planning because the government only tries to reach realistic goals in emergent situations, and they less consider to use comprehensive approach or scientific approach to solve waste problems comprehensively from “upper course” until “lower course”.

#### Resources

From the planning process, we can see that this is a linear process from survey to action. To make this plan, they use many resources as explained below :

1. Information / data primary and secondary data, for technical requirements, the data are:
  - Detailed spatial planning of Bogor Regency, to examine the land projection.
  - Population data, to measure or to predict with the correlation with waste volume
  - Land use map, to study about land use in project area.
  - Transportation, to study existing roads and traffic conditions in that area.
2. Land resources

#### Organizational

In this plan, waste management shifted from local level to be regional level. There are two reasons:

1. Land use problem, that it is not feasible for Depok Municipality and Bogor Municipality to build final disposal sites in their administrative areas. It is properly with the Bid Land theory (Willem Alonso), which is the city centre is for office, the second circle layer is for settlements, and the third is for industry or eye

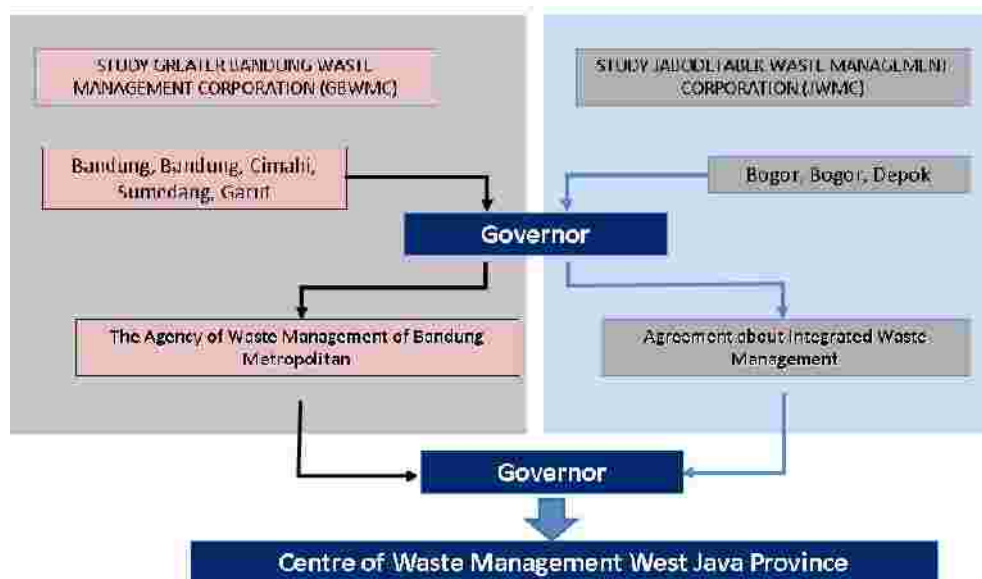
catcher. Therefore, it is almost impossible to use the urban area for the final disposal site, beside of the technically land site needed.

2. Bogor Regency had provide the land for final disposal site, but it need high cost to construct Sanitary landfill and fulfill it with technology in processing waste such as mentioned in the act No. 18 Year 2008.
3. Waste problem actually is not only becomes local problem but also regional or even national problem. If one region can not manage waste in their region will have negative for neighbor regions. The government of West Java Province learn this from Leuwigajah Case in Bandung, so they try to take over the plan from local level to regional level. The plan also change from local plan becomes regional plan.

Those reason meet the Theory of Factors of Production Which they are land, capital, labor and technology, as we assumed that the waste management is such an economic activity. Because of there are no land, and no capital, this program will never be occurred, so that to make it implemented, it is supposed to be handled by multi governments, and lead by the upper level of government, the Province of West Java.

Tabel 2

### Organizational Waste Management



## Financing

Because of the high cost needed in this project, it needs a long term periode of construction. To make it faster, the financing use the theory of Fiscal Federalism, which they are mentioned in Tabel below. In 2008, the total budget proposed by the major of Bogor Regency are 80 billions rupiah for landfill and infrastructure and 45 billions for access road to location. The source of budget come from national budget, local budget (province & regency) and privates sector. The planner use public-private sector partnership in financing this program. As the declared of the act no. 18 year 2008, consequently the National Government is supposed to give contribution in the construction. On the other hand, the province government should give the biggest fund as the upper level of the local government, to hold those three regon agglomerated in waste treatment management site.

Tabel 3

Financing System of the Integrated Waste Management System  
in Bogor – Bogor - Depok

No	Component	Sources
1	Land	Cooperation between West java Province with Forestry
2	Access Road	Local Budget of Bogor Regency
3	Planning 1) Feasibility Study 2) Analysis of Environmental Impact 3) DED 15 ha 4) DED 100 ha 5) DED access road	1) National Budget 2) National Budget 3) Local Budget of West Java Province 4) Local Budget of West Java Province 5) Local Budget of Bogor Regency
4	Access road construction	1) PT Indocement Tunggul Perkasa 2) National Budget 3) Local Budget of West Java Province, Local Budget of the three of Regency
5	Infrastructure of Sanitary Landfill	National Budget
6	Construction of Integrated management	Private

## Implementation

As top-down planning, the final disposal plan is projected will operate in 2011. To reach the goal, the implementation of plan are several step, they are:

1. Study of detailed spatial planning on local regulation No. 27/1998, based on this study actually the land projected to be final disposal site.
2. Land acquisition about 5 Ha in 2002
3. Land acquisition about 10 Ha in 2004.
4. Study of Analysis of Enviromental Impact in 2004, about 15 Ha conducted by Distarkim West Java Province, (still in evaluation by Comite of Analysis of Enviromental Impact Bogor Regency in 2009)
5. Detailed Engineering Design (DED) Sanitary Landfill of Final Disposal in 2005, about 15 Ha by Distarkim West Java Province.
6. Feasibility study of Sanitary Landfill of Final Disposal in 2007, about 100 ha
7. Detailed Engineering Design (DED) acces road to location in 2008 by Dinas Bina Marga Bogor Regency.
8. Detailed Engineering Design (DED) final disposal in 2008, about 100 Ha by Distarkim of West Java Province.

Actually there are several problem in implementation this program:

1. The comite of analysis of enviromental impact from Bogor Regency still make evaluation about enviromental impacts document proposed by Distarkim of West Java Province, so the project not will completely on time. They need political power to solve this problem.
2. Wrong estimation about budget of land acquisition for access road. They try to make mulity years budgets, so land acquisition problem is solved.
3. The objection from people who live traditionally near final disposal site. Usually land price will decreased if there is final disposal and the surrounding area will become slum areas. And they also worrying about water and air polution.

## C. Critical Review of The Plan

### Challenge

End of pipe approach. According to the basic problems of waste miss management, the level of solution, this plan use partial approach in waste problems, because this plan just solve in "lower course" or only on disposal area. But actually, the real problem of waste is also in "upper course" where the waste produced, such as households, offices, schools etc. So, The future challenge is how the local government try to encourage people to manage their own waste and make a comprehensive approach relates with waste. For examples, community awareness campaigns, community participatory, learning process for inhabitant by introducing reuse, reduce, recycle.

Inefficiency transportation. Millions of tons waste will transport to final disposal site every day. It is predicted that will caused externalities in final disposal site by automobiles travel: accidents, traffics congestion. So, the challenge is how the goverment deal with this problems.

Growth in population and the impact on waste volume. Recently, Bogor Regency has the highest population in West Java province with the number of population more than 4,4 millions, it was folowed Depok with 1,4 millions, while Bogor municipality about less than 1 millions. It is predicted in less than ten years the population will reach 10 millions peoples. Because of that, the amount of waste volume also will folds than todays.

### Limitation

Limited resources (land and finance). To make final disposal site, there are many technical specification requirements. Location is one of the considerations. It is hard to find right place for final disposal site because of the price of lands or the allocations of land. In the term of finance, it is better if waste problem become national problems.



Weakness in the policies. National policy (waste act) concern about waste management is still new (2008), even central government regulation as guidance still in progress, actually local government do not have legal responsibilities and also legal authorities to manage waste in their boundaries. So why, the implementation of the plan has many constraints.

#### References

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