

CHAPTER 1

INTRODUCTION

1.1. Background

Wastes are residues of daily human activities or solid natural processes. Over the years the buildup of waste has been gradually increasing, due to the increase of human population / human activities. The wastes that were produced is usually placed in a garbage bin and then be taken to the temporary shelters for waste or TPS. From the temporary shelters, the wastes will then be taken into the final processing place for waste or commonly called TPA. Because of the increasing waste being produces, the process of taking the waste from TPS into TPA also needed to be increased to prevent waste from overflowing in one TPS, which can cause disease and an unpleasant smell to the surrounding environment.

Genetic algorithm is a minimum or maximum unconstrained function search method that uses random selection processes, such as selection, crossover, and mutation to stimulate the next reproductive operator in an organism. Yang and Su (2007) has proven that the optimization model can reduce the sewer rehabilitation cost up to 20%. However, cost estimates were related to market research or empirical equations.

In this research, genetic algorithm is applied to the waste transport route to optimize the route, optimize in this research means to shortened the distance between TPS to TPS and also to find the most optimal place to build a TPA. Before executing the process, there will be a period to observe the places of TPS across Tangerang. Solutions will then undergo selection to form the next populations and will be crossover and mutated. After undergoing this operation, the end result will be compared with the original data to see whether the genetic algorithm optimization works well or not.

1.2. Problem Formulation

1. Will genetic algorithm be able to optimize the path of waste transport route?
2. Compared with another solution, can genetic algorithm perform better?

1.3. Scope

This study is only focusing on the route of the waste transport, and does not consider the maximum volume of the truck to pick up the waste. This study also only covers the region Tangerang and not anywhere else.

1.4. Objective

The purpose of this research is to find the most optimum route for waste transport, and to find out the most strategic place to build the final landfill so that the cost for fuel is more efficient when collecting waste from the temporary waste dump.

