MODEL FOR ALLOCATION OF MUNICIPAL SOLID WASTE
OPTIMIZATION USING
INEXACT FUZZY LINEAR PROGRAMMING
(CASE STUDY: MUNICIPAL SOLID WASTE
MANAGEMENT IN MALANG CITY)

Name of the Student: Agus Rachmad Purnama
NRP: 9108201405
Supervisor: Prof. Dr. Ir. Udin Subakti Ciptomulyono, M.Eng.Sc

ABSTRACT

Generally, solid waste management problem concerns on waste handling from the source to the final disposal of land, technology selection and proper management of waste. In concerning to this problems, many researchers have developed a model of multi attribute decision making to solve location selection problem and optimization model to solve limited resources problem and capacity expansion requirement to achieve the optimal solution for the objective.

Due to distribution information not available causing by lack of historical data and any improper measurement method this research proposed to utilize both an Inexact approach and fuzzy concept within linear programming framework. An Inexact approach takes into account an alternative system as upper and lower limit, while fuzzy concept accommodate fuzziness or impreciseness within right hand side constraint and system objective. By doing so, any flexibility within the system could be tolerable. This research proposed an Inexact Fuzzy Linear Programming for optimization modeling of the allocation of municipal solid waste in Malang City from 2011 until 2015 with system objective to minimize total cost of the system, so it can be used by related stakeholders and decision makers as a tool for a rational decision making policy.

According to the model solution, it shows that to achieve an 80% service level it need to buy 3 operational dump truck and 10 arm roll truck in the first year, the system cost significantly increase with the total cost of the system spread within Rp.11,402,074,370-Rp11,506,678,770, but at the second year the total system cost down, and become Rp. 8,682,497,185 until Rp. 8,783,304,790. At the third year of planning period the total cost of the system increase extremely around 21billion rupiahs due to lack of final disposal land, and it need to build 5 unit of 3R facility at the 5 Transfer station, while the final disposal land be expanded by area of 5Ha at the fourth year.

Keywords: Inexact, Fuzzy, Inexact Fuzzy Linear Programming, Optimization, allocation of municipal solid waste.