

Survey of Urban Waste Management Using the Life Cycle Assessment Method (Case Study: Rasht City)

ABSTRACT

Background Today, population growth and increased human activities in urban societies have produced a large amount of waste. The waste volume causes problems in human health and environmental contamination. Due to the amount of waste produced and compounded, there are several options for managing it that have different environmental impacts. Choosing the right option requires backup tools. Recently, a tool called the Life Cycle Assessment has been developed to improve the situation. The purpose of this study is to compare the environmental impacts of four urban waste disposal scenarios in Rasht city.

Methods: In this research, the amount of waste and required data for logging are determined, then the quadruple life cycle assessment stages associated with each waste management scenario including the first scenario (15% recycling, 50% compost, landfill sanitation), the second scenario (20% The third scenario (20% incinerator, 50% compost, sanitary landfill) and the fourth scenario (21.4% compost, non-sanitary landfill) were analyzed. Finally, the results of the IWM1 model were analyzed. Then the results were assigned to the classes: energy consumption, greenhouse gases, acid gases, photochemical fluids and toxic emissions. And then the ecological index of each scenario was obtained.

Results: The results showed that by managing 50% of the waste in the organic fertilizer plant by composting and landfilling, part of it in landfill and energy recovery and increasing recycling rates by 15%, it can be seen that there is a significant reduction in emissions of environmental pollutants including gas Methane greenhouse emissions were toxic like lead, cadmium, copper, mercury and dioxin. The ecological index was the best scenario is $-2.10E+6$ And for the most devastating scenario $+2.39E+07$ was obtained.

Conclusion: Regarding environmental assessment and comparing the results of the life cycle logbook, the first scenario (collection; compost; recycling; landfill) plays an important role in reducing pollutant loads, greenhouse gases and energy consumption, and taking into account the climatic and geographical conditions of the area The study was selected as the best management option and was made available to experts and decision-makers.

Keywords: Municipal waste, Life cycle assessment, Management method, Rasht city