Solid Waste Management in Kandy Municipal Council

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1. Introduction

Solid waste is a great problem not only in Kandy Municipal Council (KMC) but also in many countries in the world. It causes to variers problem such as social, environmental, health, economical and many more problems. So it is essential to think about solid waste management in Sri Lanka.

1.1 Objective of the Study

The objective of the study is to study the Solid Waste Management in KMC.

1.2 Scope of the study

The scope of the study is to investigate the current practices in Solid Waste Management in KMC, investigate the issues in current solid waste management system in KMC and to make recommendations to overcome these issues.

2. Literature Review

Thurul et.al. (2005), maintenance of an adequate amount of active biomass has been described as a key factor to a safe and stable operation. For retention of high concentration of active biomass, immobilization on inert support media has been reported to be very effective. For that, coir is the suitable raw material for producing such a media with excellent surface properties. A BOD removal efficiency of 89% percent can be achieved by using bio brush media with 200m^2/m^3 SSA under 1.0 BOD kg/m^3/d of Organic Loading Rate.

3. Methodology

Mainly solid waste management in KMC was studied under three main categories.

i. Collection
ii. Transportation
iii. Disposal

According to preliminary data collection, it was proved that transportation and collection were in a satisfactory level. But disposal section has considerable issues. The disposal was divided into four categories for easy inspection.

i. Generation
ii. Centralized processing for segregation
iii. Alternative disposal facility
iv. Environmental problems

Then the generation was divided into following four major categories and a questionnaire survey was conducted to assess the current practices, to get the people's opinion on waste segregation and to get the people's opinion on on-site composting.

i. Reduce
ii. Waste segregation
iii. Onsite-composting
iv. Polluter pay / Garbage tax

Then according to the results of the questionnaire survey, some recommendations were made to overcome the identified issues of solid waste management in KMC.

One of main environmental issues of Gohagoda open dumping site is the mixing of leachate with ground water and Mahaweli river water. As a solution for leachate issue, bio brush medium leachate treatment plant was designed by studying Nuwaraeliya leachate treatment plant.

4. Results and Discussions

4.1 Questionnaire Survey

- Current practices

According to questionnaire survey, 18% percent of people throw their waste into collection centres. Another 22% of them dispose their waste on-site (burying and burning) while the rest 60% percent of people hand over their waste to municipal council collectors.

- Waste Segregation

70% percent of people like to waste segregation while the rest of them do not like that. If the polluters pay method was introduced for those who did not like to segregate, 11% of them agreed to waste segregation.

- On-site composting

58% of people do not like to on-site composting because of lack of space and technical knowledge, sanitary problems and busyness while the rest of them like it. 56% of people from not like people like on-site composting if a composting bin is provided free of charge.

4.2 Design of leach ate treatment plant

Table 1: Results of the test samples of NuwaraEliya site

	Influent 1	Influent 2	Effluent 1
BOD_5/(mg/l)	49.9	50.8	18.5
PH	6.6	6.8	6.6
COD/(mg/l)	85	123	22
Nitrate Nitrogen/(mg/l)	290	140	65
Phosphorous /(mg/l)	20	50	10

According to above results, nitrogen and phosphorous are over range. This shows 63.6% efficiency of BOD removal via coir brush medium.

Table 2: Results of the test samples from Gohagoda Site

	1	2	3	4	5	6
BOD_5 /(mg/l)	260	255	128	129	40	173
PH	7.53	7.97	7.28	8.02	7.65	7.52
COD/(mg /l)	650	399	233	352	105	240
Nitrate Nitrogen /(mg/l)	330	20	130	110	3	40
Phosphor ous /(mg/l)	70	50	60	120	0.6	10

Assuming 70% of BOD removal efficiency, a coir brush leachate treatment plant coupled with a constructed wetland was designed as a best low cost solution using existing tank system at Gohagoda dumpsite.

5. Conclusions

Using this proposed leachate treatment system, the acceptable levels can be achieved with respect to ambient water quality standards. But to achieve the proper performances, proper testing and maintenance procedures should be followed.

References

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