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A survey on household solid waste management (SWM) with special reference to a peri-urban area (Kottawa) in Colombo

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Abstract

A properly managed effective waste management programme increases the health and environmental quality of the country .This survey examines the status of Solid Waste Management household level in a peri-urban area (Kottawa in Colombo) in relation to the willingness of the people for the participation of an upgraded programme and the level of awareness of the people about the environmental and health hazards associated with disorganized management of solid waste. A pretested and self-administered questionnaire was used for primary data collection covering 50 households which were selected randomly. Data were analysed according to the descriptive statistics. The common waste types include food, paper, plastic, metal, glass and batteries. The rate of waste generation from more than 70% of the households exceeds 2kg per day. 94% of the total waste collection was from the kitchen. Nearly 50% uses waste pits in their home gardens. Other methods of kitchen waste disposal were garbage truck collection (44%), burning (44%), composting (16%) and incineration (10%).66% of the households practice burning to dispose papers and cardboard. Disposal of non biodegradable waste such as glass, plastic, batteries and metal were done through a separate garbage truck. Waste separation at household level was practiced by 52% while 42% do not practice it. Compost bins were popular among 30% of the households. However, compost bins were unknown to 6%. Active participation for home composting was observed among 26%. Awareness about the environmental hazards caused by improper waste management was 100%. Only 2% of the respondents did not have much concern about the health impact of improper waste management. 54% of the household was unsatisfied with the prevailing waste management practices and 70% of them expect more involvement by the government to correct the problem. The results also showed that 26% of the households were not aware of waste recycling, reuse & reduction. However, 96% of the respondents agreed to co-operate & to participate for a proper waste management programme. Suggestions produced by the respondents to implement an effective waste management programme include composting (34%), efficient waste separation (14%), establishment of government owned waste collecting canters (28%), and provision of standard waste bins for household use under a subsidized programme and standard garbage trucks with a unique honking facility 12%.

*Keywords:*Peri-Urban area, Solid Waste Management, Waste disposal

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1. Introduction

Increasing population level, urbanization and increasing living standards have enhanced the solid waste generation in developing countries[1].Management of solid waste is getting increased attention at national and local levels[2]. The whole process of Solid Waste Management in both urban and peri-urban areas of Sri Lanka needs improvements. Disorganized and inappropriate waste disposal has created severe environmental issues such as wild life habitat loss, air pollution, reduction of aesthetic value of the environment and destroying water bodies etc.,that have direct impact on the society and the country's development. Therefore, the introduction of an effective waste management programme at least for densely populated urban and peri-urban areas of the country will be vital for the sustainable development of the country. Improper municipal Solid Waste Management (SWM) will be a threat to public health and which leads to decline in the quality of the people's life[3]. SWM is a growing problem in Sri Lanka due to absence of proper solid waste management systems within the country. Present day solid wastes are collected in mixed scale and disposed in places, which are environmentally very sensitive such as marshy lands, forests, wild life habitats, water resources, road sides, public places and low lying areas. In addition, open dumping is also very common in Sri Lanka and it negatively affects to the country's economy by destroying aesthetic value and scenic beauty of the environment and increases the risk of health problems[4]. Therefore, this study attempts to understand the status of Solid Waste Management household level in a peri-urban area (Kottawa in Colombo) in relation to the willingness of the people for the participation of an upgraded programme and the level of awareness of the people about the environmental and health hazards associated with disorganized management of solid waste.

2. Methodology

Western Province is one of the provinces which has higher population density in Sri Lanka. Therefore, Colombo (6.9344° N, 79.8428° E) Districtin the Western Province was selected as the research area. Surveys and informal discussions were carried out to gather data. A deductive approach was selected to gather the data. The target population was comprised with all the households in Colombo District (2,323,826) but it was impossible to do an investigation with such a large number within a limited time period and inadequate financial budget, a multi stage random sampling technique was employed to select an appropriate sample to evaluate the objectives of this study.

Therefore in the initial stage, one Divisional Secretariat (Maharagama) was randomly selected out of 13 Divisional Secretariats in Colombo District. In the second stage five Grama Niladhari Divisions (Kottawa South, Kottawa East, Kottawa North, Kottawa West, Kottawa City) were randomly selected out of all Grama Nildhari Divisions in the above Divisional Secretariat and eventually 50 households were selected as the sample size. The analysis was based on descriptive statistics.

3. Results and Discussions

According to the collected demographic data, majority of the households (82%) comprised with more than three family members andmost of the respondents are literate and with a greater percentage (36%) who has received a tertiary (University) education.Eighty percent of the households have more than Rs.15000 fixed income per month while 12% of the respondents do not have proper income source. Results further depicted that, mothers usually do the waste disposal in 52% of the households and kitchen waste is the most common (94%) domestic waste type among other types of waste such as, plastic, papers, metals, glasses, batteries and electronics.The results of the present study are in agreementwith the findings of Hai and Ali[5], the rate of waste generation in more than 70% of the households exceeds 2kg per day**.**

Table 1.Prevailing household waste disposal methods

Types of Waste	Method of household garbage disposal								
	Burn %	Burry%	Dump in flowing water%	Dump on road sides %	Garbage tractor %	Recycle%	Reuse%	Compost%	Other%
Food waste	10	44	0	0	44	2	0	16	6
Papers and cardboard	62	4	2	4	16	2	4	4	2
Glasses	26	12	0	4	44	6	2	0	6
Metals	0	8	2	6	46	6	2	0	30
Plastic	0	24	0	6	42	4	4	0	20
Battery and electronics	O	16	0	4	40	0	6	0	32
Average	16.3	18	0.25	4	38.6	3.3	3	3.3	16

Referring to the previous studies, it has been shown that household waste separation before disposal is at poor level[1]. According to the results of the present study, considerable fraction of the households (48%) do not separate waste before disposal. Composting is one of the commonly using and environmental friendly ways to manage the degradable waste. Of the sample, 26% of the respondents prepare the compost domestically and only 30% of the respondents have standard composting bins and 6% of the respondents are not aware on the standard composting bins. Generally, the majority of respondents showed concern about issues of solid waste management and all respondents (100%) were concerned about the environmental hazards related to improper waste storage and disposal of waste. Eighty four percent of the respondents concern about the health issues related to burning garbage and other improper management of waste. Results clearly shows that a 96% of respondents are willing to participate in any program which aimed at reducing, recycling, composting of domestic garbage. There are few suggestions from respondents to manage the waste. These include, establishment of government waste collecting centres (28%), home composting (34%), provision of standard waste bins according to a loan scheme (12%) and waste collecting vehicle with easily recognizable honk (12%). Majority of the respondents (54%) are not satisfied with the function of current waste collecting vehicle. Most of the respondents (94%) are willing to separate decomposable and non decomposable waste, if government establishes proper waste management channel and majority of them (66%) like to bring their domestic waste to the waste collecting centres. Results further depicted that respondents like to transfer in to bio-degradable waste collecting bins (66%) with the purpose of reducing environmental issues arising from non decomposable waste. About 70% of the respondents expect high contribution from the government on SWM.

4. Conclusion & Recommendation

The survey has being able to provide an idea of the prevailing household SWM in Peri-urban area Kottawa. Their knowledge on environmental and health issues related with inappropriate waste management are satisfactory, even though very few of them practices improper waste disposal methods such as open dumping , dump waste in flowing water and they are not practicing the waste recycling, reusing and reduction sufficiently. People in Kottawa area like to cooperate and participate for a proper waste management system. Therefore, their involvement should be encouraged for the development and implementation of waste management system. Also, it was found that further commitment of the government is required for implementing a proper solid waste management system in thearea. It will be very effective if, private sector collaborate with the government in the process of solid waste management.

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