

CURRENT STATUS AND PUBLIC PERCEPTION ON SOLID WASTE MANAGEMENT IN MALABE, SRI LANKA

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ABSTRACT

Municipal Solid Waste Management has drawn an increasing attention all over the world due to the severity of the problems associated with public and environmental health caused by unplanned disposal of solid waste. This research project was conducted to understand the current household solid waste management practices, problems associated with domestic waste disposal, investigate the residents' perception on waste recycling and reuse options and willingness to change to adopt proper waste management practices in Malabe City area. The research was carried out based on a comprehensive questionnaire survey conducted by selecting a random set of houses. It was noted that the generation of the degradable solid waste loads is considerably higher than the other types of solid waste. It was also revealed that even though the most of the residents are concerned about the environment and the household solid waste disposal but the active participation on it is limited. This can be attributed to the various constraints such as lack of awareness, lack of the support from the regional authorities and inadequate solid waste disposal facilities. It was found that majority of the residents use plastic bags for the storage. Moreover, residents already categorize the waste into degradable and non-degradable components which implies the feasibility of implementation of proper solid waste management strategies in the area. It was also noted that the peoples' awareness and facilities for waste recycling and reuse options are low. People are not satisfied about the service of the garbage truck and they are willing to even pay for it if the number of collection trips per week is increased. It was also revealed that peoples' perception on the various solid waste management strategies is positive and they are willing to support for implementation of proper solid waste management and disposal strategies in the area.

Key words: Domestic, Solid Waste, Disposal, Management

1. INTRODUCTION

Municipal Solid Waste Management has drawn an increasing attention all over the world due to the severity of the problems associated with public and environmental health caused by unplanned disposal of solid waste [1]. Rapid increase of population, the growth of industries and also the changes of life style has significantly increased the solid waste load for the past few years [2].

Most importantly urbanized areas of developing countries like Sri Lanka are threatened with the inadequate solid waste management and disposal facilities causing to considerable social and environmental impacts. Particularly Malabe city which is 10 km east from Colombo, the

commercial capital of Sri Lanka is a rapidly developing city with the increase of the settlement of people during the past few years and designated as one of the future smart cities of the country. In this context, design and execution of proper household solid waste disposal and management techniques and policies are of crucial importance to minimize the negative social and environmental impacts associated with the disposal of higher loads of solid waste in the area especially with the limited space.

Consequently, this research project was conducted to understand the current household solid waste management practices, problems associated with domestic waste disposal, investigate the residents' perception on waste

recycling and reuse options and willingness to change to adopt proper waste management practices in Malabe City area. The knowledge generated through the research project aims to contribute to the design and implementation of proper solid waste disposal and management techniques and policies in Malabe City area and hence to minimize the stress on the environment caused by unplanned disposal of solid waste loads results with rapid urbanization and population growth.

2. METHODOLOGY

As discussed in Section 1.0 this research project was conducted in Malabe City area which is a fast growing economic Centre in Colombo City in Western province, Sri Lanka. The area consists of several leading educational, IT, banking and industrial organizations and is located in the near vicinity of the Southern Express way and Outer Circular Highway promoting the area as a hub for settlement of people.

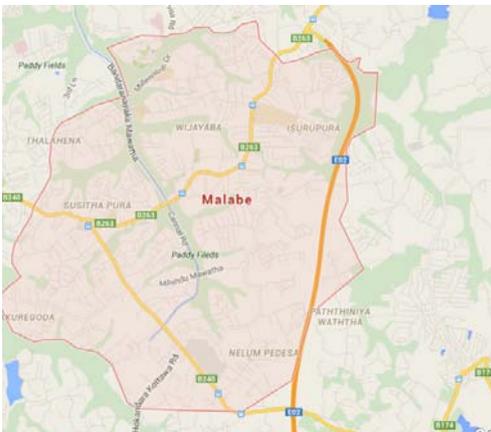


Figure 1: Location

The data collection of this research project was mainly done by conducting a questionnaire survey by visiting 75 houses which were selected randomly and located within 2 km radius of Malabe city. A member from each house was questioned about their methods of waste disposal, views and suggestions on the existing solid waste disposal and management strategies in place,

problems related to solid waste management in the area, concern on the environment and knowledge and attitudes on waste reuse and recycling options.

Additionally, the demographic data as in the area from 2003 to 2014 and records of daily garbage truck loads were collected in consultation with the Kaduwela Municipal council in order to understand the trend of population increase and the amount and different types of solid waste generate in the area.

3. RESULTS

Data analysis was conducted in several stages. Firstly the demographic data was analyzed in the area. Secondly the data records of garbage trucks was analyzed to understand the average amount of different types of waste loads generate in the area. Finally, the results obtain for each question of the questionnaire survey was analyzed to understand the current solid waste management and practices in the area and to understand the people's opinion on the different types of waste management strategies and their awareness and willingness to adapt for improved waste management practices.

Figure 2 shows the results obtained from the demographic data analysis. As can be seen in Figure 2 it shows an increasing trend of the population in the area. This clearly indicates the importance of design and implementation of adequate solid waste management practices not only to create a living friendly environment but also to achieve the goals of sustainable development.

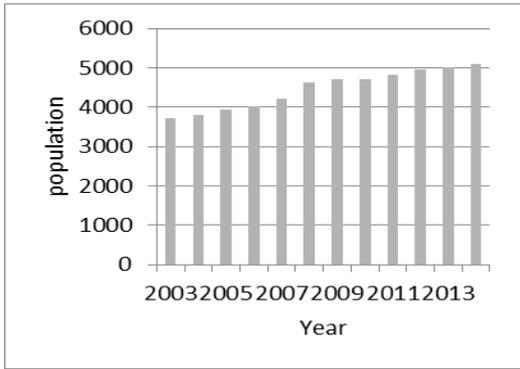


Figure 2: Variation of population from year 2003 to 2014

Figure 3 shows amount of solid waste generated in year 2010. As can be seen in Figure 3 the generation of the degradable solid waste loads is considerably higher than the other types of solid waste. This suggests that the importance of prioritizing the degradable component of waste in the context of design and implementation of adequate solid waste disposal and management strategies. In this context, implementation of effective recycling strategies of bio-degradable waste such as composting and production of energy can be strongly recommended.

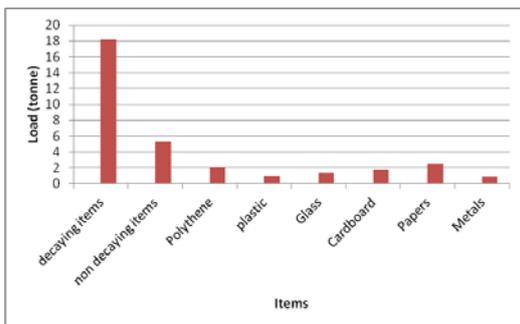
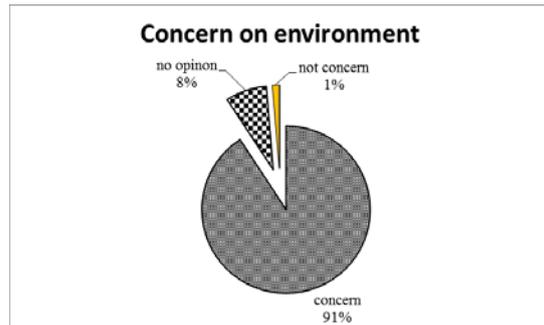
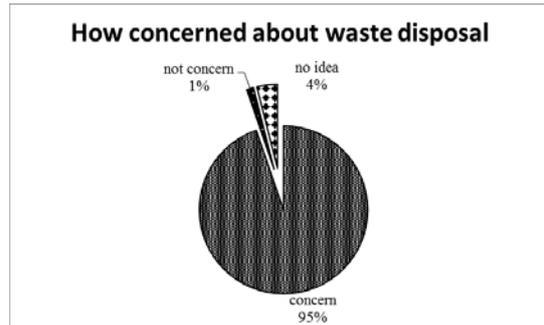


Figure 3: Average amounts of different types of waste per day

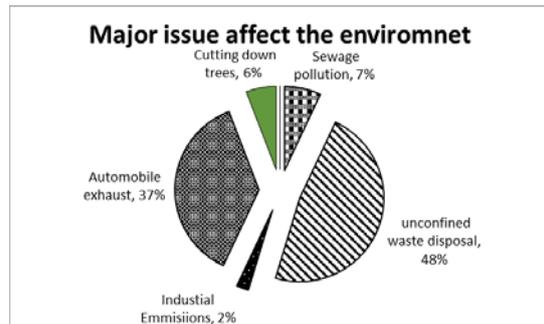
Figure 4 shows the outcomes of the analysis conducted based on the questionnaire survey. As can be seen in Figure 4(a) and Figure 4(b) most of them are concerned about the environment and the waste disposal of their houses. Majority thinks that the major issue affect the environment is unconfined waste disposal (Figure 4(c)).



(a)



(b)



(c)

Figure 4: How concern about the environment, waste disposal and major issue affect the environment

People use various storage options to store their solid waste (Figure 5) whereas majority of them use plastic bags. Plastic is a non-bio degradable and photo-grade materials and has been identified as a devastating material for entire ecosystem [3]. This highlights the importance of attempts to reduce plastic consumption and provision of reusable storage bags by the municipal council for solid waste storage at the site. On the other hand it makes clear that even though people are concerned about the environment the active participation towards protecting the environment

by practice is limited. This can be attributed to inadequate facilities and lack of knowledge on waste management and reduction at site.



Figure 5: Storing Garbage

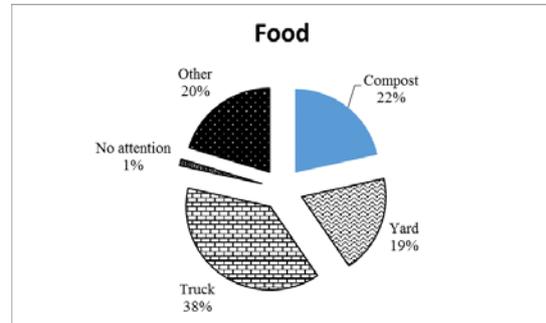
Figure 6 shows the current practice on waste categorization. As can be seen in Figure 6 around 68% the people in Malabe City area categorize their waste into degradable and non-degradable (Figure 6) before disposal. This implies that since most of the people in Malabe area is fairly educated if proper waste management strategies are designed and introduced the implementation would not be difficult, as people already concern on them.



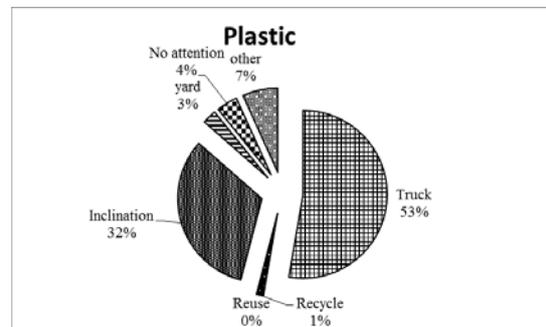
Figure 6: Categorize your waste

As can be seen in Figure 7, majority of the people who categorize their waste dispose their food items, plastics, metals, glass and e-waste to the garbage truck. Around 32% incinerate plastics unaware of the pollution caused to the environment. In this context the introduction of regular plastic collection methods and recycle centres is of utmost important Furthermore, as

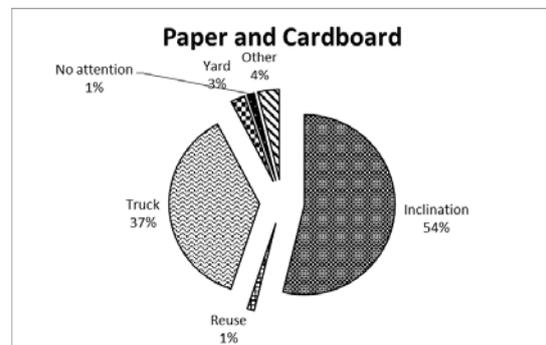
can be seen in Figure 7 majority of the people dispose their e-waste and metal into the garbage truck directly due to the lack of awareness, knowledge and facilities on reuse options of such waste.



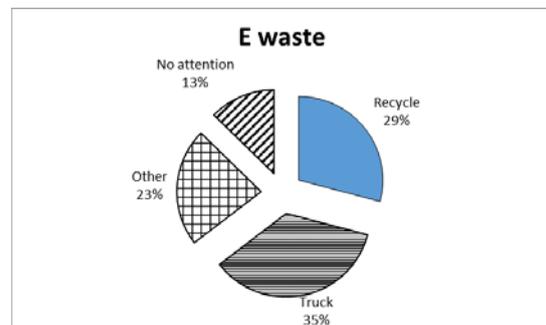
(a)



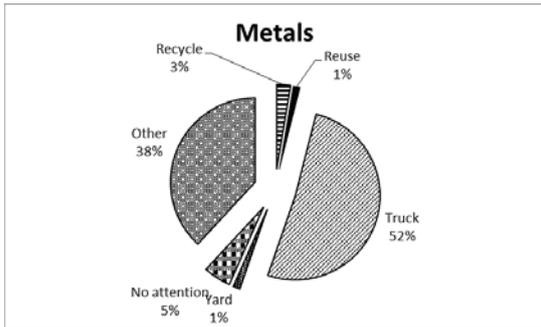
(b)



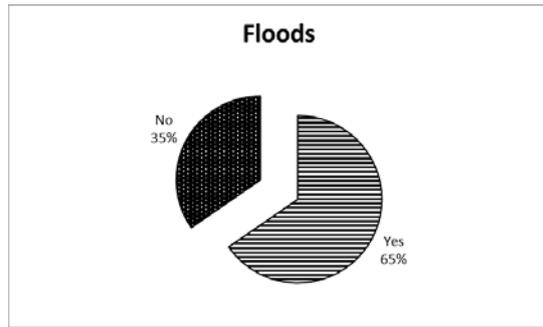
(c)



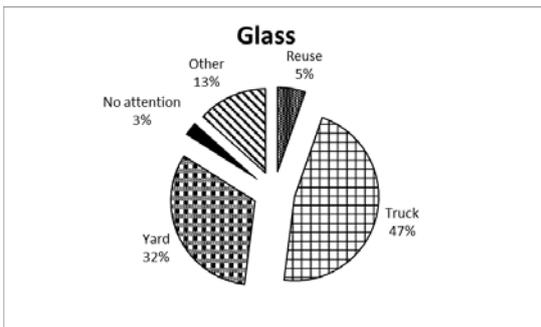
(d)



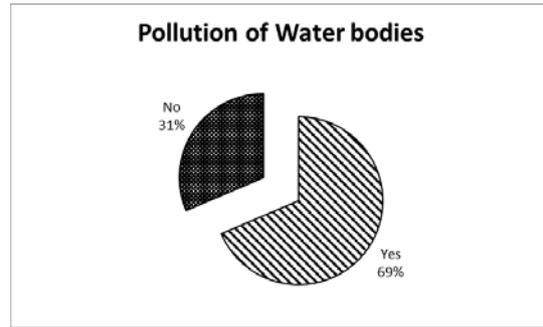
(e)



(b)



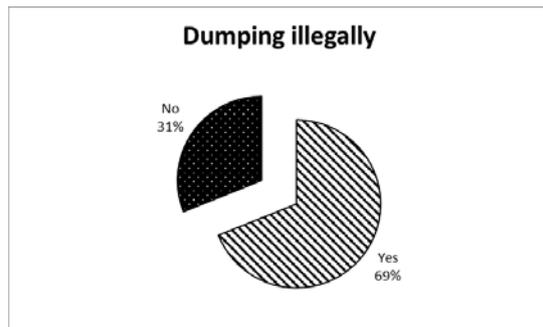
(f)



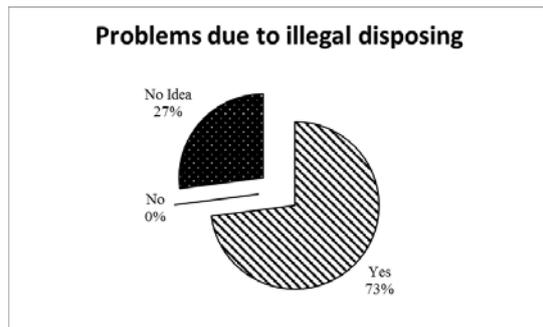
(c)

Figure 7: Current waste disposal methods

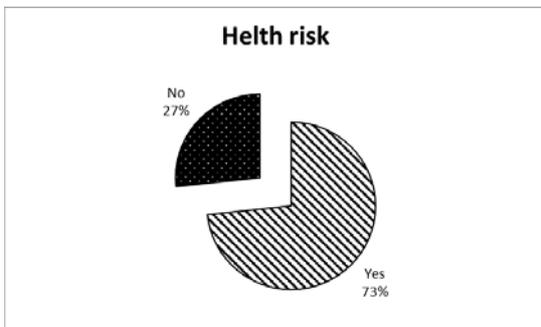
As shown in Figure 8(a) majority of the respondents are concerned about the health risks due to improper waste management Figure 8(a). Therefore they are willing to adhere to proper waste management strategies as it reduces health risks. More than half agreed that flash floods are due to solid waste blocking the drainage systems and gullies figure 8(b). And majority of respondents questioned agreed that people illegally dump garbage and it is a reason for the blockage in drains and for the pollution in the nearby water bodies Figure 8(c)-Figure 8(e).



(d)



(e)



(a)

Figure 8: Problems

As can be seen in Figure 9 majority of the people are not happy with the service of the garbage truck as it only visit once a week and does not come on holidays (Figure 9(b)). People believe that this as a reason for frequent illegal dumping

of waste in the area. People are happy if the garbage truck can visit at least twice a week and are even willing to pay for the truck if the numbers of visits are increased (Figure 9(c)).

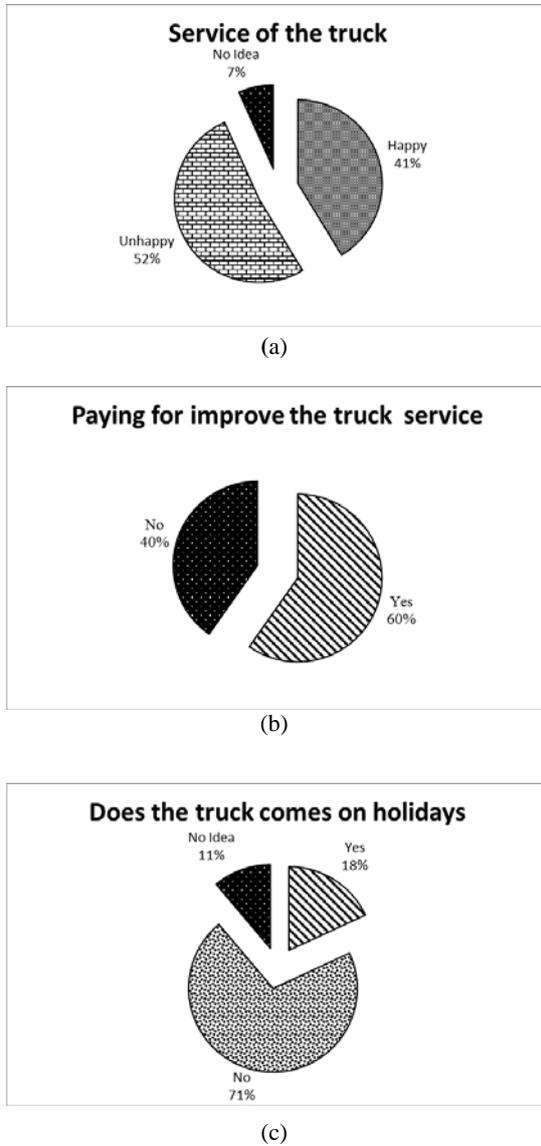


Figure 9: Truck Service

According to Figure 10(a) people are currently using compost techniques to compost their degradable waste. However majority of them are willing to learn more about composting and practice them as it saves money and is a natural fertilizer Figure 10(b).

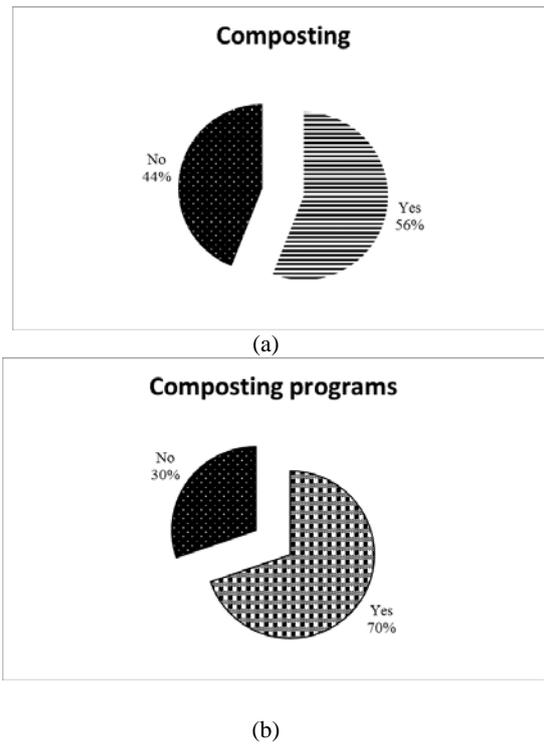
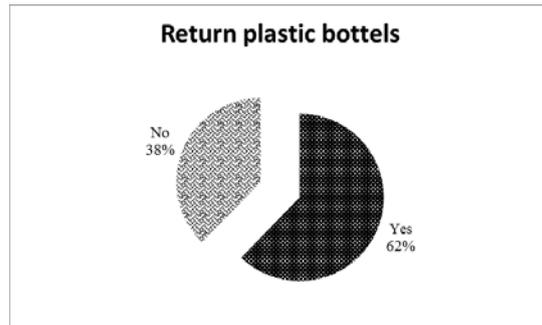


Figure 10: attitudes about composting

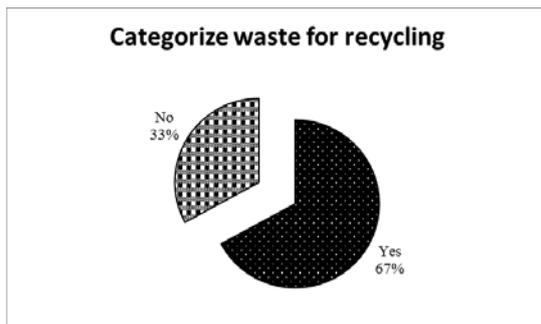
Most of the people agree that waste recycling as a good option for management of non-degradable waste (Figure 11(a)) and willing to categorize their waste for recycling (Figure 11(b)). This highlights that they are willing to support for waste recycling if proper strategies are implemented by the authorities. On the other hand majority is even willing to use recycled products (Figure 11(c)). This indicates that if waste recycling processes are implemented that can create a market for the recycled products and hence the maintenance and management of recycling facilities would not be a challenge to the relevant authorities other than the initial investment.



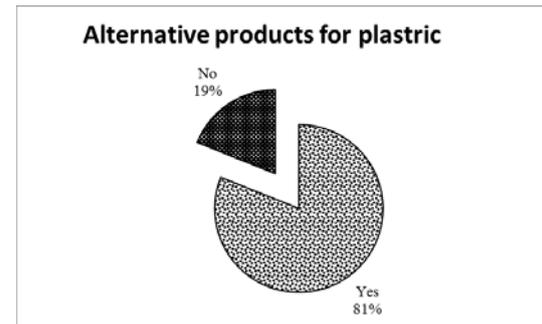
(a)



(a)



(b)



(b)



(c)

Figure 11: Waste Recycle

As can be seen in Figure 12, majority of people are willing to return the used plastic bottles to shops and even willing to use an alternative product instead of plastic. So if necessary steps are taken to implement such a program the harm caused to the environment can be reduced.

Figure 12: Attitudes about plastic

4. CONCLUSION

This project has been able to provide an indication of the current household solid waste management practices in Malabe and peoples' perception on waste management and adaptation. It can be concluded that even though most of the residents are concerned about the environment and the house hold solid waste disposal but the active participation on it is limited. This can be attributed to the various constraints such as lack of awareness, lack of the support from the regional authorities and in adequate solid waste disposal facilities. No adequate facilities present or have introduced by the authorities for the disposal of non-bio degradable waste such as plastic, e-waste and metals. Furthermore, peoples' perception on the various solid waste management strategies is positive and they are willing to support for implementation of proper solid waste management and disposal strategies in the area. This implies the regulatory authorities about the feasibility of implementation of proper solid waste management strategies in the area if the necessary financial and technology requirement can be satisfied.

5. ACKNOWLEDGEMENT

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