

## Evaluation of a Poly-plastic Collection System in Matara District, Sri Lanka: A Case Study in Kamburupitiya Pradeshiya Sabha

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### ABSTRACT

The presence of waste is an indication of overconsumption and inefficiency of removing used materials. Sustainable approaches need to be adopted for a proper waste management system. As an attempt to address this issue, *Kamburupitiya Pradeshiya Sabha* has introduced a poly-plastic collecting program in Matara district. As an initial step, *Mapalana ihala Grama Niladhari* (GN) division was selected to introduce the program. It focuses on collecting polythene and plastic waste for recycling. Hundred households were randomly selected and subjected to this programme. A pre-tested structured questionnaire was administered to find out the effectiveness of the current waste disposal system, and the relationship between socioeconomic factors with the current waste disposal system. Descriptive and Cramer's V correlation co-efficient analysis were used for the statistical analysis. In the sample, 56% of respondents were male and 44% were female. 8% of respondents stated that wives as amenable person in disposing waste. The results revealed that, 58% of the respondents had been adapted to the proper waste management after introducing the new program. It further revealed that there is a moderate association between effectiveness of poly-plastic disposal programme with the age, education and income of the target group. Increments in above socioeconomic factors moved them towards polythene/plastic recycling method from burning them at home. In addition, there is a significant association ( $p < 0.05$ ) between land extent and effectiveness of the poly-plastic collecting programme. However, there was a weak relationship and low association with socioeconomic factor such as the gender. The present study concludes that the program has not reached to its highest effectiveness thus recommends to take more efforts to increase the effectiveness of the waste management system by monitoring the waste collection in the study area.

**Keywords:** Socioeconomic factors, Waste, Management, Collection

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### Introduction

At present disposal of waste is a critical environmental issue and has become a national concern in Sri Lanka. This problem has become more severe over the last years due to increasing population and consumption of wide ranges of products (Amangabara *et al.*, 2007). Further, the issue of waste disposal has been aggravated due to absence of proper waste management systems in the country. Therefore, proper waste management system is an urgent requirement to Sri Lanka (Bandara, 2010). Waste management is the collection, transportation and disposal of garbage, sewage and other waste products in a proper way. Waste management encompasses management of all processes and resources for proper handling of waste materials, from maintenance of waste transport trucks and dumping facilities to compliance with health codes and environmental regulations (Karunasena and Wickramasundara, 2014).

In many instances waste are not properly segregated and collected. Waste are often

dumped in environmentally sensitive places like road sides, marshy lands, low lying areas, public places, forest and wild life areas, water sources etc., causing numerous negative environmental impacts such as ground and surface water pollution, air pollution (CEA, 2014). Alternatively, some people burn non-degradable substances as a method of waste disposal. However, burning of waste is far more harmful to health (Bell and Bremmer, 2013).

In order to give a feasible solution to this burning issue, *Kamburupitiya Pradeshiya Sabha* has introduced a poly-plastic collecting program as an initial step in *Mapalana Ihala* GN division. It focuses on collecting polythene and plastic in order to recycle and make the area environmentally healthy. On the other hand, this program motivates people to segregate non-degradable waste and bio-degradable waste properly and promote composting in household levels. The program is based on 300 houses out of 650 houses by giving 300 black color polythene bags for each household to collect polythene and plastic. The polythene bag is

collected by a tractor allocated by *Pradeshiya Sabha* once a month (every last Thursday) between 9-12 a.m. However, the effectiveness of the newly introduced program is still questionable. Therefore, current study is an attempt to find out the effectiveness of the current waste disposal system, and the relationship between socioeconomic factors with the current waste disposal system.

#### Methodology

A pre-tested structured questionnaire was used to identify socioeconomic factors that influence proper waste disposal in the study area. Socioeconomic factors such as education, gender, age, employment/unemployment, land area, and income were considered to find out the effectiveness of the programme. For the present study, 100 households were randomly selected from the 300 households who were subjected to this poly-plastic collecting program. To analyze the collected data descriptive and Cramer's V correlation co-efficient analysis were used.

#### Result and discussion

Of 100 participants, 56% of respondents were. The highest percentages of respondents (30%) were in the age group 31- 40 years. 25% of villagers were in the 61-70 age group. 58% of respondents stated that wives as amenable person for disposing waste, while 16 % of respondents stated that it was husband's duty. Remaining 26% stated that waste disposal was done by any other family member. According to the educational background of the respondents, it was found that 32 % of responds had reached up to G.C.E. Ordinary level in school education and 28% had completed G.C.E Advanced level which shows that over 50% of the sample had secondary education.

A highest percentage (64%) of respondents were house wives while others were mostly businessman, government and non-government employers while 21% were unemployed. 3% of the respondents reported the highest income level; between Rs.41000-50000 per month. Related to the land ownership of the respondents, 60% of the responds have over 15 perches.

Study investigated the effectiveness of the program that introduces the proper waste management system. Results revealed that about 58% of the people had been adapted to the current waste management program while about a half of the sample reported to have

knowledge about other waste management methods such as composting. To study the relationship between the current waste disposal and the socio- economic factors, Cramer's V correlation co-efficient analysis was used (Table 1). It was found that there is a moderate and significant association ( $p < 0.05$ ) between effectiveness of poly-plastic disposal project and the socioeconomic factors such as age, educational level, income. The main way of disposing their wastes is handing over to the *pradeshiya sabha* tractor. However, majority of people (70%) are unaware of the exact time of the arrival of the tractor. There was a statistically strong and significant association ( $p < 0.05$ ) between area of land and effectiveness of poly-plastic collecting programme and there was a trend to hand over waste to the tractor when the land area is low. There is a weak relationship and low association ( $p < 0.05$ ) with gender (Table 1). It is interesting to note that the employment status, and the effectiveness of the poly-plastic collecting programme has a very low association and it is not significantly related.

Table 1: different variable with effectiveness of poly-plastic project cross tabulation

Variable	Cramer's V	Relative Strength	Approx Sig.*
Income	0.430	Moderate association	0.001
Area of Land	0.786	Strong, high marked association	0.000
Education level	0.608	Moderate association	0.000
Employment	0.010	Very low, negligible	0.926
Age	0.679	Moderate association	0.000
Gender	0.206	Weak, low association	0.039

#### Conclusion

Based on the results, it was concluded that effectiveness of proper waste management program is only 58%. There were significant associations ( $p < 0.05$ ) between effectiveness of poly-plastic disposal project and socioeconomic factors such as level of education, age, income, land area and gender. However, area of land showed a strong association, income level, age, and educational level showed a moderate association and gender showed a weak and low association. Study revealed that relationship between respondents' employment status and effectiveness of the current waste disposal programme was not significant. Present study

recommends taking more efforts to increase the waste management system by monitoring the waste collection in the study area. Furthermore, to increase the effectiveness of the programme the households should be more aware about the waste collecting schedule. Extension programs should be conducted to improve the knowledge of villagers regarding proper waste management. Further, introducing waste collecting bags for the rest of the villagers may be a fruitful solution to move them towards the proper waste disposal.

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