

A STUDY ON THE RELATIONSHIP BETWEEN SOCIO ECONOMIC CHARACTERISTICS OF URBAN RESIDENTS AND THE QUANTITY OF WASTE GENERATED IN THE BATTICALOA MUNICIPAL COUNCIL AREA

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ABSTRACT

The problem of waste generation and its management are well understood and very popular today. Increasing rate of waste generation and the limited availability of new landfills are very critical issues in this regard. There should be an obvious relationship between socio economic characteristics and quantity of waste generated in residential areas.

A study was conducted with the objective to find out the relationship between and socio economic characteristics of urban residents quantity of waste generated in the Batticaloa Municipal Council area. The relevant information was collected by using a pre-tested structured questionnaire. The data were collected by personal interviews with selected 80 household heads.

The results indicated that there is a linear relationship between quantity of waste generated and socio economic characteristics of urban residents in the study area. The degree of relationship was high with family income and followed by family size and average age of the family. The per capita waste generation in the study area was about 0.5 kg per day.

The main sources of waste were food, kitchen refusal, garden refusal, and wrappers. The composition of waste mainly consists

of garbage, paper, kitchen refusal, polythene bags, cloths, and glass pieces.

Suggestions to improve waste management include combating improper disposal, improving the quantity and quality of vehicles and other facilities, providing black polythene bags for temporary storage of waste and practice possible recycling procedures.

INTRODUCTION

The problems associated with domestic solid waste and its consequences are well known issues today. Ever increasing population multiply the severity of the problems with increased generation of solid waste and restricts the availability of new landfills. Numerous social, economical and environmental problems associated with domestic solid waste generation are emerging daily, which local authorities have to solve.

Socio economic characteristics of a household have a strong influence in the quantity as well as quality of domestic solid waste generated in a household. The main objective of the study is to explore the relationship between the quantitative aspects of domestic solid waste and socio economic characteristics of households. The sub objectives of the study include identification of waste disposal methods practiced by households, measuring the percapita waste generation in the study area, the level of satisfaction attained by the people with waste management activities of the Municipal Council, and households spending on temporary storage facilities for waste before final disposal.

RESEARCH METHODOLOGY

The study was carried out in the Batticaloa Municipal Council Area. The population of the study area is around 78,000 persons. The study area is divided into 48 Grama Niladhari Divisions and 57 small villages (Statistical Hand Book-

Batticaloa, 2000). Among the 57 villages 4 villages were selected purposively. From each village 20 households were selected randomly. Personal interviews with heads of households were used as method of data collection. A pre tested questionnaire was used to collect the relevant data.

The data obtained from field survey was analyzed using SPSS software. Descriptive statistics, frequency distribution and multiple linear regression were used as analytical tools.

RESULTS AND DISCUSSION

A total of 80 households from 4 sampled areas were analyzed. In the 80 households, a total of 272 individuals were found. Among the population 58% were male. Among the 80 households, 68 households owned the residing house and the rest were living in rented houses. More than 60% of households have a family size of 3 or 4. More than 70% of households were educated between 6 years to A/L. Only 5.5% of the population finished their graduation. More than 50% of working individuals were employed in the private or business sector and nearly 40% of them were either government or semi government employees.

Table 01 The Descriptive Statistics of Variables

Variable	Mean	Std. Deviation	Numbers
Avg. weight (kg/day/household)	1.8281	0.6877	80
Family Size (No.s)	3.6800	0.8800	80
Avg. Age (yrs)	29.4262	7.6026	80
Family Income (Rs/month)	8376.8500	5237.00	80

Source: Survey Data

There were 4 main sources of waste identified, namely food, wrappers, kitchen refusal and waste from garden. People in the study area dispose their waste by several ways. About 60% people utilized BMC waste collection services to dispose their daily waste. A considerable amount of respondents (about 27.5%) have their own waste yards on a temporary basis. The waste yard is usually in the form of pits and its sufficiency period ranging from one week to one month for waste disposal.

Households provided some suggestions to improve the waste management services provided by BMC. The important ones include, stopping improper disposal, providing black polythene for temporary storage of waste and increase vehicle for waste collection and other waste infrastructure facilities in a central place (See Table 02).

Table 02 People Suggestions on Improvement of Waste Management Services

Suggestions	Percentage
No Comment	6.00
Provide better vehicle Facilities	21.25
Provide black poly bags	16.25
Stop improper disposal	26.25
Improve labour attitudes	12.00
Build structure for temporary waste storage	7.25
Increase frequency of collection	11.00

Source: Survey Data

A multiple linear regression analysis was done to find out the relationship between waste generated in a household and socio economic traits such as income, family size and average age of household members.

The multiple linear regression model is given below

$$W = \beta_0 + \beta_1 Y + \beta_2 F + \beta_3 A + e$$

Where;

W- Quantity of domestic solid waste generated per day in a house (kg)

Y- Average monthly income in Rupees

F- Family size of the household (number of household inhabitants)

A- Average age of the household inhabitants (in Years)

β_0 - Constant

$\beta_1, \beta_2, \text{ \& } \beta_3$ - Co efficient of independent parameters

e- Error term

The fitted model for the study is as follows,

$$W = 0.544Y + 0.292F + 0.098A$$

$$(6.146)^* (3.366)^* (1.130)^*$$

(P<0.05)

$$R^2 = 0.482$$

The above fitted model indicates that there was a significant relationship between quantity of waste generated and average monthly income. The same is true for the size of the family. Average age does not show any such relationship.

The per capita waste generation in the area calculated was approximately 0.5kg per person per day.

Table 03: The ANOVA Table for the Model

Model	Sums of Square	df	MSS	F value
Regression	18.011	3	6.004	23.574*
Residual	19.355	76	0.255	
Total	37.366	79		

*Significant at P<0.05

Table 04: The Correlations among Variables

Pearson Correlation	Average weight	Family Size	Average Age
Average Weight	1		
Family Size	0.406*	1	
Average Age	0.185*	-0.141	1
Family Income	0.635*	0.237*	0.237*

*Significant at $P < 0.05$

CONCLUSIONS

Four main sources of waste generated are kitchen refuse, wrappers, food and garden waste. All households have garbage and polythene bags in the composition of waste.

There is a positive linear relationship between socio economic characteristics and quantity of waste generated per household. The quantity of solid waste generated per household was 1.85kg and the per capita waste generation was 0.5kg per day in the BMC area

REFERENCES

1. Fernando S.T.K.K,(1995) An analysis of socio economic factors affecting the quantity and composition of domestic solid waste in Kandy Municipal area *A Practicum Report PGIA University of Peradeniya.*
2. Fernando V,(1995), Feasibility of resource recovery from domestic solid waste within Kandy Municipal area. *Practicums report PGIA.*
3. Secretariat for infrastructure development and investment Report 1998. Metropolitan solid waste management study.
4. State of the Environment in Asia & the Pacific Region (1990).
5. Economic & Social Commission for Asia & the Pacific Region, *United Nations. Bangkok, Thailand 1992.*
6. Statistical Handbook Batticaloa District (1999), *District Planning unit, Kachchery, Batticaloa*