

# Awareness Level and Implementation of Solid Waste Management Practices among Rural and Urban Household in Haryana

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**Abstract – Household solid waste consists of garbage (such as bottles, jars, clothes, disposables, food packing, nourishment scraps, newspaper, magazines and yard trimmings etc.) that originates from individual houses. Solid waste management has become a critical issue in Indian urban and rural area to protect environmental quality. A challenge for the authorities as the rate of generation of waste is very high. To handle this problem, many countries are turning to reduce, reuse and recycling which is a constructive tool for solid waste management. In addition, for successful development and implementation of any solid waste project, community participation in collection and design of facilities is essential. To come up with a sustainable technology of solid waste, it requires a survey on the awareness and practices regarding solid waste management. The present study aims to measure and compare the awareness level of rural and urban respondents of Haryana state towards reducing, reusing and recycling of solid waste management. A random sample of 400 respondents of Rewari, Jhajjar, Bhiwani and Kurukshetra districts of Haryana has been taken into consideration for the purpose of study. The primary data through a structured questionnaire has been collected and mean, standard deviation and t- test were applied for the purpose of analyzing the data. The obtained findings of the study reveal that respondents under consideration are moderately aware about solid waste management practices (i.e. reduce, reuse and recycling). The findings further reveal that there is no significant difference between rural and urban respondents on solid waste management practices.**

**Keyword: Household Solid Waste Management Practices, Reduction, Reuse, Recycling**

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## INTRODUCTION

The waste industry has increased immense pressure in past few years because of a continuous increase the production of waste materials (Burnley, 2007), increasing population, rapid urbanization and due to the need of more sustainable and environmentally acceptable waste management policy. Growing population and lack of well organised waste management strategies at both local and national levels exacerbates this problem. Solid waste management involves control of origination, storage, collection, processing and discarding of solid waste with the purpose of protecting environmental quality, natural resources and protection of human health. Awareness of effectual waste management practices is one of the common issues in developing countries. At the point when respondents are awareness about waste, they go to be educated as well as know the essence of waste management which will make them liable. Awareness means to improve their knowledge in waste management. Solid waste management which is done along the lines of a precise use by

'reducing', 'reusing' and 'recycling' depends on managerial technique and strategies. Hence, awareness of people and knowledge are the main elements of practice on solid waste management. Waste 'reduction', 'reuse' and 'recycling' -the 3Rs of environmental conservation - shows an important element of any genuine endeavour to explain the waste management problem. The 3Rs has been divided into six vertical steps: 'prevention', 'reduction', 'reuse', 'recycle', 'recovery' and 'disposal'. The first R (reduce) include prevention and reduction of waste. Reduction of solid waste means the minimization and elimination from waste materials. Following the hierarchy, the next best option for solid waste management is the second R ('Reuse') and this enclose the usage of an item after its use, either for a purpose similar to that which it was intended or for an entirely new one. The third R ('recycle') refers to waste materials which can be converted to the new product or raw material. The process of recycling includes the 'collection', 'separation' and 'processing' of waste. 'Reduce', 'reuse' and 'recycle' are the recommended solution

for the consolidated solid waste management. There is no lasting solution to solid waste management issues, the main thing we can minimise and control waste production by well awareness and practices. This study therefore assesses the awareness and practices of solid waste management in Haryana.

## REVIEW OF LITERATURE

Solid waste management practices have intrigued the scientist's academicians and researcher for a long time. Lots of studies have been attempted to measure the awareness level of people and to suggest some strategic solution to minimize solid waste.

**Awopetu et al (2013)** studied the level of awareness concerned with 'reduction', 'reuse' and 'recycling' solid waste management. The aim of the study was to examine the public opinions and 'awareness' level towards reducing, reusing and recycling of solid waste. The structural questionnaire was developed and distributed to 560 respondents belong to low, medium and high region. The results of study revealed that the household's awareness level concerned reducing/reuse/recycling solid waste was fairly high. The findings also revealed that most of the respondents were aware about solid waste management practices i.e. reuse, recycling and reduction. **Banga and Margerat (2013)** examined household knowledge and practices on the separation and recycling of solid waste in Kampala, Uganda. The study was conducted with a view to examine the practices of waste separation and recycling activities. A survey was administered to 500 households randomly selected from Kampala. Average, standard deviation and z- statistics were used to survey the data for the purpose of study. The result indicates that the urban area households were more aware of solid waste separation and recycling practices as compared to rural area households. **Licy et al (2013)** studied the 'awareness' level and practice towards household solid waste management in Kerala among 300 school students. The data were analyzed with the help of average, standard deviation and independent t-test. The result depicted that students of high school were more aware than higher secondary school students regarding household waste management and the difference was framed significant statistically. **Zen et al (2013)** studied the level of awareness of households towards reduction of solid waste in Malaysia. A survey was administered to 262 households selected from Malaysia. Mean standard deviation and t – statistics were applied for the result. The results indicated that respondents rarely adopted practices of waste minimization such as reducing and compost. **Balakrishnan (2016)** examined household's solid waste management practices in kodungaiyur, (Chennai). The purpose of the study was to examine the Knowledge and awareness level of residents about solid waste management practices. The after-effects of the study shows that

most of the respondents have a high level of awareness regarding solid waste management practices, but very few of the households having knowledge about 'reuse', and 'recycling of solid waste. **Boateng et al (2016)** examined of solid waste management practices among rural and urban area. Chi square test was used to compare variables of the study. The study revealed that the urban households have lower mean scores than rural household on solid waste management practices. The study also shows that the solid waste management practices in the urban area were less effective as compared to the rural area. **Ramos et al (2016)** assessed the 'knowledge' and 'practices' of solid waste management between secondary schools. The study findings that the solid waste management practices are moderately and fairly practiced by the respondents. **Abdullah et al (2017)** conducted a study on the awareness about household solid waste management. The study found that lots of respondents believed that low level of awareness and knowledge were the major reason of the problem. The study also revealed that the households rarely practiced reuse, recycling and reduction. The study reported that about 34% of the respondents were aware of reuse and recycling of solid waste. **Bom et al (2017)** focused on public awareness and practices of recycling. The researcher found that 80% of the respondents selected for the study indicated that high level of 'awareness' regarding recycling of solid waste.

Review of literature clearly indicates that the awareness level of people towards solid waste management practices differ region wise. Secondly researches conducted abroad in an environment which is differ from Indian environment and have less applicability in India. Therefore, in the present investigation shows the 'awareness' level of respondents belongs to the state of Haryana towards household solid waste management practices.

## OBJECTIVES OF THE STUDY

The study conducted to obtain the specific objective of awareness level and implementation of the practices regarding solid waste management. The following objectives have designed:

1. To measure the awareness level of households regarding solid waste management practices.
2. To compare the awareness level of rural and urban households regarding reduction of solid waste.
3. To compare the awareness level of rural and urban households regarding reuse of solid waste

4. To compare the awareness level of rural and urban households regarding recycling of solid waste.
5. To measure the level of implementation of solid waste management practices in rural area and urban households.

### **HYPOTHESIS OF STUDY**

1. Households are not aware about solid waste management practices.
2. There is no significant difference in the awareness level of rural and urban households towards reduction of solid waste.
3. There is no significant difference in the awareness level of rural and urban households towards reuse of solid waste.
4. There is no significant difference in the awareness level of rural and urban households towards recycling of solid waste.
5. Respondents are not interested in implementation of solid waste management practices.

### **RESEARCH METHODOLOGY**

The study is descriptive in nature and designed to measure the awareness level of household regarding solid waste management practices. The study managed in the "rural" and "urban" area households from the four districts of Haryana. The cross-sectional data through a structured questionnaire has been collected. The data of survey analyzed descriptively by using 'frequency distribution', 'average', 'standard deviation', and student t-test was applied to compare the awareness level of rural and urban households regarding solid waste management practices and its implementation.

### **SAMPLE**

The sample of the present study consists of 400 households from rural and urban area of Haryana. To make it more representative sample, four districts (Rewari, Jhajjar, Bhiwani and Kurukshetra) from each zone were drawn randomly. Efforts were made to include the equal size of respondents from both urban as well as rural area of four districts of Haryana.

### **TOOLS**

The questionnaire used by Sidique et al, 2010, Meneses et al, 2005 for measuring awareness level and execution of solid waste management practices was taken into account while making questionnaire

for that study. The awareness level of respondents toward solid waste management and was well tested for reliability and validity scales. It was designed on the basis of five point Likert scale (i.e. 'strongly disagree to strongly agree'). It consisted of total 24 items distributed into three dimensions: reduction (5 items), reuse (5 items), recycling (6 items) and implementation of practices (8 items). The reliability of all the variables included in the questionnaire was checked both individually as well as in their totality by applying Cronbach's Alpha. The Cronbach's Alpha value was found to be .984, which show a high level of reliability of the scale.

### **ADMINISTRATION OF TESTS**

The tests used in the present study were administered individually to all the respondents. The household has been treated as the sampling unit and information was gathered from the members of the households. The members of the households were contacted to their respective place and their willingness to impart related information was sought. The tests were administered after developing rapport with the respondents to get relevant information for the study.

### **SCORING OF THE TEST**

The solid waste management practices questionnaire used in the present study was designed on the basis of Likert type five point scale (i.e. 'strongly disagree' to 'strongly agree'). For every item score can range from 1 to 5, initially each item was scored separately and then a single total score was obtained by adding up the individually items score. Finally total 24 items regarding solid waste management practices (i.e. reduction, reuse and recycling) were considered for further processing of data.

### **RESULT AND DISCUSSION**

#### **Level of awareness:**

The present study focuses on studying and measure the (level of awareness) and implementation of practices of solid waste management. It has also been designed to compare the rural and urban respondents on account of 'solid waste management' practices. The mean score of rural and urban households to measure the 'level of awareness' regarding 'practices' of solid waste management has given in table 1

**Table 1. Combined Mean Score of Rural and Urban Households on Awareness for Solid Waste Management.**

Waste Management Practices	Group	Combined Mean Score
Reduction	Rural	3.5910
	Urban	3.5280
Reuse	Rural	3.6790
	Urban	3.5690
Recycling	Rural	3.5441
	Urban	3.5016
Grand total	Rural	10.8241
	Urban	10.5986

Source: Primary Data

The result of the present investigation that respondents have moderate level of awareness on account of solid waste management practices. The results also show that the mean score of rural area respondents is higher as compared to urban area respondents regarding solid waste management practices. It means rural area respondents are more aware as compared to urban area respondents as their mean being 3.5910 and 3.5280 respectively for reduction practice. The mean score of rural and urban respondents for reuse practice of solid waste are 3.6790 and 3.5690 respectively. It indicates that rural area households have a high level of awareness regarding reuse of waste material as compared to urban area respondents. In case of recycling practice, the mean score of rural and urban households are 3.5441 and 3.5016. Hence, the first hypothesis of the study cannot be accepted.

**Difference in Awareness level on Reduction**

As per aim of the study to investigate that the difference in level of awareness among respondents is statistically significant or not, t- test applied. The mean score, S.Ds and t- values of score of rural and urban households regarding reduction of solid waste are given in (table 2.1 and table 2.2)

**Table 2.1 Group Statistics**

Variable	Group	N	Mean	Std. Deviation	Std. Error Mean
Waste Reduction	Rural	200	3.5910	1.1707	.08278
	Urban	200	3.5280	1.0823	.07653

Source: Primary Data

**Table 2.2 Independent Sample Test**

		T-test Equality of means				
		t	df	Sig (2-tailed)	Mean difference	Std. Error difference
Waste Reduction	Equal variances assumed	.559	398	.577	0.0630	0.1127

Source: Primary Data

Table no. 2.1 and 2.2 presents the mean and S.Ds of both the groups along with the independent sample t- values of observed variables. T- test was applied to compare the awareness level of rural and urban households regarding reduction of solid waste and results are shown in table no 2.1 and 2.2. The mean score of rural and urban respondents on waste reduction is 3.5910 and 3.5280 with the standard deviation of 1.1707 and 1.0823. It shows an almost equal level of awareness regarding reduction of solid waste. The p- value (sig.) of .577 is greater than alpha .05, therefore the null hypothesis 'II' that there is no significant difference in the awareness level of rural and urban households towards reduction of solid waste was accepted. Hence, the second hypothesis gets accepted.

**Difference in Awareness level on Reuse:** The one of the objectives of a study to compare the awareness level of respondents on reuse of solid waste.

**Table 3.1 Group Statistics**

Variable	Group	N	Mean	Std. Deviation	Std. Error Mean
Waste Reuse	Rural	200	3.6790	0.8968	0.0634
	Urban	200	3.5690	0.8487	0.0600

Source: Primary Data

**Table 3.2 Independent Sample Test**

		T test Equality of means				
		t	df	Sig (2-tailed)	Mean difference	Std. Error difference
Waste Reuse	Equal variances assumed	1.260	398	.208	0.1100	0.0873

Source: Primary Data

Table no. 3.1 and 3.2 presents the mean and S.Ds of both the groups along with the independent sample t- values of observed variables. T-test was applied to compare the 'awareness' level of 'rural and urban' households regarding reuse of solid waste and results are shown in table no 3.1 and 3.2. The mean score of rural and urban respondents on waste reuse are 3.6790 and 3.5690 with the standard deviation of 0.8968 and 0.8487. It shows an almost equivalent degree of awareness regarding reuse of solid waste. The p- value (sig.) of .208 is greater than alpha .05, there for the null hypothesis 'III' that there is no significant difference in the 'awareness' level of 'rural and urban' households towards reuse of solid waste was accepted. Hence, the third hypothesis gets accepted.

**Difference in Awareness level on Recycling:** As per the objective of the study to compare the

awareness level of respondents on recycling of solid waste.

**Table 4.1 Group Statistics**

Variable	Group	N	Mean	Std. Deviation	Std. Error Mean
Waste Recycling	Rural	200	3.5441	1.1584	0.0819
	Urban	200	3.5016	1.0901	0.0770

Source: Primary Data

**Table 4.2 Independent Sample Test**

		T test Equality of means				
		t	df	Sig (2-tailed)	Mean difference	Std. Error difference
Waste Recycling	Equal variances assumed	.378	398	.706	0.0425	0.1124

Source: Primary Data

The mean and S.Ds of both the groups along with the independent sample t- values of observed variables is depicted in table 4.1 and 4.2. T- test was applied to compare the 'awareness' level of 'rural and urban' households regarding recycling of solid waste and results are shown in Table No 4.1 and 4.2. The mean score of rural and urban respondents on waste recycling are 3.5441 and 3.5016 with the standard deviation of 1.1584 and 1.0901. It shows an almost equal degree of 'awareness' regarding recycling of solid waste. The p- value (sig.) of .706 is greater than alpha .05, there for the null hypothesis 'IV' that there is no significant difference in the 'awareness' level of 'rural and urban' households towards recycling of solid waste was accepted. Hence, the fourth hypothesis gets accepted.

**Implementation of practices:** The mean score of rural and urban households to measure the implementation of practices regarding solid waste management.

**Table 5. Group Statistics**

Implementation of solid waste management practices	Group	N	Mean	Std. Deviation
	Rural	200	3.7093	1.0166
	Urban	200	3.6825	0.9894

Source: Primary Data

A close inspection of table 5 reveals the moderate level of implementation about solid waste management practices. The result also shows that rural area respondents have scored higher as compared to urban area respondents regarding solid waste management 'practices'. It means rural area

respondents are more interested in 'implementation' of solid waste management practices as compared to urban area respondents as their mean being 3.7093 and 3.6825 with the standard deviation of 1.0166 and 0.9894. It is clear from the results of the present investigation that rural and urban area respondents are interested in implementation of solid waste management practices. Hence, the fifth hypothesis gets rejected.

**MAIN FINDINGS**

The findings, which have emerged out from the present study are as under:

1. Rural area respondents are more aware as compared to urban area respondents regarding solid waste management practices.
2. There is no significant difference in the level of awareness of rural and urban households regarding reduction of solid waste.
3. Both, rural and urban households have an almost similar level of awareness for reuse of solid waste.
4. As far as recycling of solid waste is concerned, no significant difference has found in the awareness level of rural and urban households.
5. Rural area respondents are more interested in 'implementation' of solid waste management 'practices' as compared to urban area

**DISCUSSION**

There are many types of management strategies that could be utilized at both local and national level and recently have seen a shift towards a new management policy that encourage the recovery, reduction, reuse and recycling of waste practices. The findings of the present research reveal that most of the rural respondents in all of the four districts are more aware about 'reduction', 'reuse' and 'recycling' of solid waste as compared to urban respondents. The high level of awareness of rural households regarding solid waste management practices is significantly influenced by rural traditions, low income, low available resources, culture and myths regarding all old products. It has been observed that urban area produces more waste than rural one. An urban household needs proper attention on the local level concerning solid waste management practice. The obtained results get support from previous research conducted by Awopetu et al (2013), Banga & margerat (2013), Boateng et al (2016) also concludes that degree of awareness regarding solid waste management

practices was differ area wise. The findings of the study also reveal that there is no significant difference in the degree of awareness of rural and urban respondents regarding reducing, reuse and recycling associated with solid waste management. It clearly shows that both rural and urban households are willing to participate in the different aspect of waste management practices. To attain this objective proper knowledge, education and campaign regarding solid waste management program should be provided by the Government at the national level. The proper Government policies, financial assistance, short term planning in waste management, social motivated behaviour, awareness programme, available recycled and reusable product all these factors are contributing to manage household solid waste in recent time.

### **IMPLICATION OF STUDY FOR FURTHER RESEARCH**

The present investigation limits itself to measure the awareness level and 'implementation' of solid waste management 'practices'. Awareness information alone is not encouraging a change in behaviour of people rather they should understand what solid waste is, what it does to the environment and public health and responsibilities are in the term of fixing the problems. There is further scope of research to determine the perception, knowledge and attitude of people towards solid waste management. By spreading practical knowledge and positive attitude towards the management of solid waste can help to maintain sustainable development and Eco friendly environment in the world.

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