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VALUATION OF SOLID WASTE MANAGEMENT IN AHMEDABAD CITY - BY CONTINGENT VALUATION METHOD

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Abstract

Solid waste management has become very important in most countries of the world. In some places, the government is responsible for solid waste management. While in some cities, a body designated by the government is responsible. In some places, the government and private organizations take up this responsibility according to the public private partnership model. Solid waste is solid or semi-solid material discharged into the environment after consumption. Ahmedabad Municipal Corporation is discussed in the present research paper. In A.M.C. 99% of solid waste is collected by Whereas the chances of recycling the waste are very less. In already established solid waste management, door to door collection management is taxed. But how much if a citizen wants to pay tax to a corporation for waste disposal and recycling? Should citizens help the government to save the environment? This research is based on that. The main area of research is the city of Ahmedabad. Ahmedabad city is divided into six zones. Sample selection is done according to the proportion of population living in the zone and the amount of waste generated from the zone. A stratified sampling method has been used for sample selection. Then a random sample is selected. Research findings have been obtained through multiple regression module.

Keywords: *Solid Waste Management, Ahmedabad Municiple Corporation, Existed Waste Management Body, Stratified Sampling Teqniques, Contingent Valuation Method, Regression module.*

I INTRODUCTION

"The environment is deteriorating," "The atmosphere is getting polluted," "Global warming is a fact." "Global conditions are worsening," "monsoonal storms and drought conditions have increased." All these news are found in newspapers almost every day. Along with this, other news "Plastic bag consumption despite ban," "Plastic bag entanglement causes sewer jams and floods," "Some countries have to import solid waste to be effective in solid waste management," "Increase in solid waste" etc. These kinds of news are also covered in current newspapers. Are these two related? Is there any relationship between environment and solid waste?
Yes, there is a direct and clear connection between the two. Environment provides as many things to human beings. One of them is the raw material for life. When things taken by the environment are processed, made usable, consumed and then returned to the environment, they take the form of waste. But where did the environment come in all this? What is its role in waste?
"According to Iyengar and Shukal, Environment serves three roles in terms of human existence. One, provides resources for production and consumption. Second, it provides environmental services such as a clean environment. Third, as a sink for waste disposal – more waste than the environment's capacity to absorb waste creates pollution."[1]
This way, waste is not a problem. But too much waste that disturbs the balance of the environment for waste disposal is a problem.
The total quantity of Solid waste generated in india is 160038.9 TPD of which 152749.5 TPD of waste is collected at a collection efficiency of 95.4%. 79956.3 TPD (50 %) of waste is treated and 29427.2 (18.4%) TPD is landfilled. 50655.4 TPD which is 31.7 % of the total waste generated remains un-accounted.[2]

II REVIEW OF LITERATURE

A lot of research has been done in the world on solid waste management. Thus there have been many studies on contingent valuation method. In view of research, some such studies are presented below.
In the early stages of environmental consideration the Contingent valuation method was not as popular as other methods. "Wantrup was the first, who mentioned Contingent valuation method in 1947. He wrote an article in the Journal of Farms Economics."[3] "David, the second reasercher who brought the topic 15 years later in 1963. used the contingent valuation method to evaluate the recreation potential of Maine woods."[4]

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"NOAA pannel, On March 24, 1989, the oil spill from Exxon Valdez oil spill occurred in Prince William Sound in the Gulf of Alaska attracted the attention of environmentalists."[5]
Similarly, solid waste management was also not effective at the initial stage of urbanization. At the same time, plague in Surat and frequent epidemics in different cities attracted the attention of the government towards effective solid waste management.
"Venkateswaran in his study, It was emphasized that what kind of situation can arise mainly from unmanaged disposal of solid waste? During the year 1994, plague spread in the country, the origin of the plague was the city of Surat. In Surat, the disease was spread due to dumping of garbage on the banks of the Tapi river, due to the mixing of garbage with the water. Recycling and less use of landfill sites were emphasized in the research."[6]
"Balasubramaniam conducted a study, with the objective of determining the price residents are willing to pay for solid waste disposal in Madurai city, India. 10 people each from 15 different areas of the city were selected as samples for the research. 96% of the residents were willing to pay for proper disposal of solid waste. Out of which 2% people were willing to pay less than ₹50, 43% between ₹51 to ₹100 and remaining 50.7% were willing to pay more than ₹100.[7]
"Ajit Debnath in his article, deals with the city of Nagon in the north-eastern state of Assam, India. 2% of the population of the city i.e. 200 samples were selected for the research using stratified sample sampling procedure. 94.5% of residents were willing to pay an average of ₹ 40 per month for solid waste disposal from their city."[8]
"Seemashri Shubdarshini researched willingness to pay for improvements in solid waste management in an environmental context in Paradip city of Orissa. In which 110 houses/families were included. The high income group estimated a monthly average of ₹ 62.50. The middle income group had a monthly average of ₹ 31. While the low income group estimated a monthly average of ₹ 12."[9]
"Tumpa Hazra et al. in their reaserch, in which the perception of solid waste among residents of Kolkata Municipal Corporation involved 667 respondents. Respondents were willing to pay an average of ₹ 207.54 per annum. While the annual average cost for open waste bins and waste collection vehicles is ₹ 190.81, if citizens dispose of waste in two ways at home, it is estimated to be ₹ 62.18 per year and if they dispose of waste in three ways at home, the cost is estimated to be ₹ 305.44 per year."[10]
"Qingbin Song et al. in their study, they talk about improved solid waste management in Macau, segregating waste so that waste can be recycled. In this survey of 250 respondents, they were willing to pay 38.5 Macanese Pataka (MOP) monthly."[11]

III OBJECTIVE

1. To know the existing structure and budget of solid waste management in Ahmedabad Municipal Corporation.
2. Evaluating the Effectiveness and Environmental Quality of Solid Waste Management in Ahmedabad Using Contingent Valuation Method.
3. To study the amount citizens of Ahmedabad are willing to pay for effective solid waste management.

IV INTRODUCTION OF STUDY SUBJECT

According to the Environmental Literacy Council, When a living organism takes something from the environment, then consumes it and gives it back to the environment, it is called waste. All living things on Earth use raw materials from the environment to give back to the environment and are recycled by other living things. But among all living beings human beings use the most raw materials and increase the recycling possibilities of nature but these recycling possibilities do not grow as fast as in nature and not all waste is decomposed in the environment which affects the environment and creates waste.[12] Thus the need for solid waste management arose in big cities and municipalities. Waste means not only solid waste, but also waste in liquid or gaseous form. Yet the problem of solid waste is the biggest of all. Because this one thing is connected to the common citizen living in the city along with the big projects. The disposal of waste which requires a whole management. This is a management task not only of collecting waste from the city, but also of sorting out the waste, making it recyclable through a systematic process. The task of solid waste management is to ensure that the remaining waste is rendered harmless before it is returned to the environment. But this operation has been neglected by the local system of the city for years. In India, from Waste management and handling rules 2000 to Waste management and handling rules 2016, many rules and methods have been given for solid waste management for cities. However, this management is still in its infancy.

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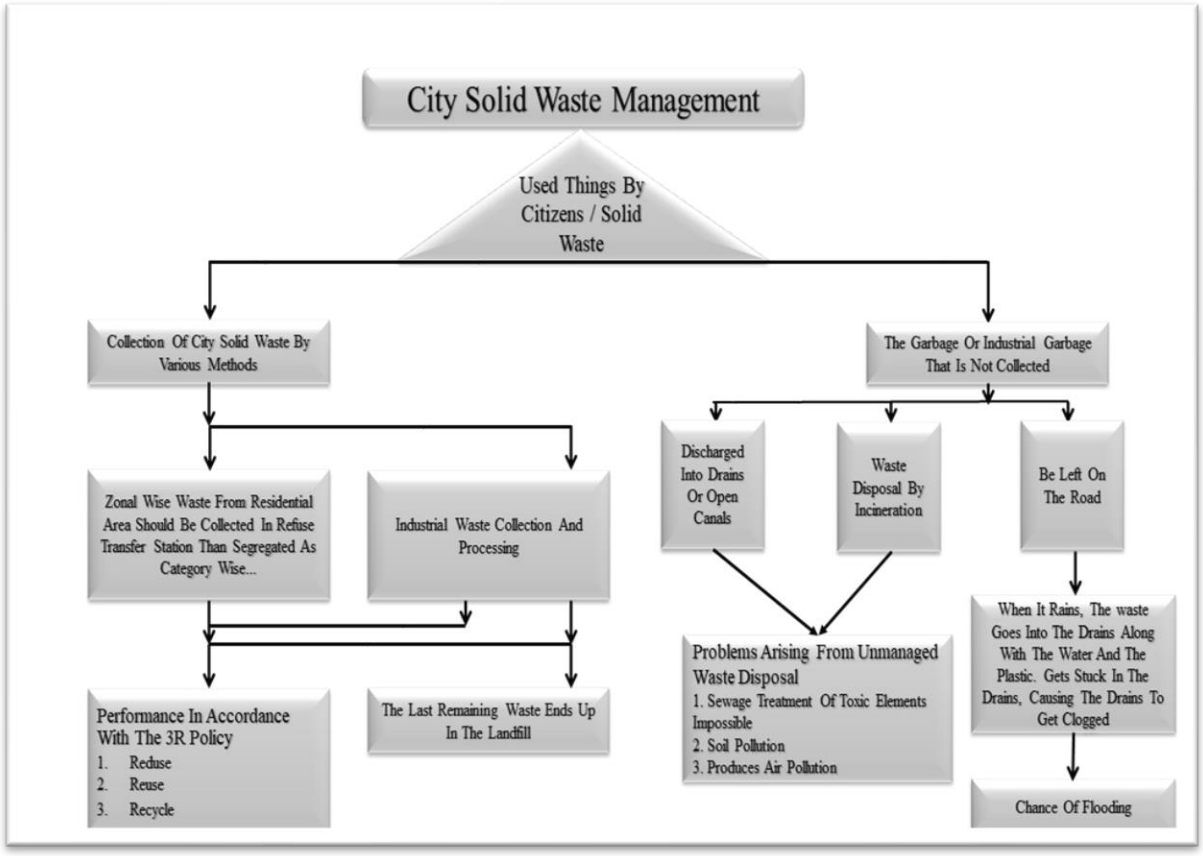

Fig. No 1. City Solid Waste Management Module
Source :- from author for Basic knowledge of S.W.M.

This is one such model, which is followed by solid waste management of every city. This means that collected waste, which is ultimately left in a landfill, and uncollected waste, which is disposed of improperly. Both of them are harmful to the environment. Which increases soil, water and air pollution. Hence the need for more effective management.

V INTRODUCTION OF STUDY AREA

Gujarat is located in the westernmost part of India. Its main city is Ahmedabad. Ahmedabad is the seventh most populous city in India. National Highway No. 8 connecting Delhi and Mumbai passes through Ahmedabad. Ahmedabad city is located at 23.03° N latitude 72.58° E longitude. Sabarmati River passes through the city of Ahmedabad. Which divides the city into new and old city areas. Ahmedabad city spread over an area of 466 square kilometers from 2014 to 2020 has expanded to 505.74 square kilometers after 2020. In which about 68 lakh population lives. The education rate of Ahmedabad city is 89.60%.[13]
Ahmedabad is India's first World Heritage City. It has been more than 600 years since the establishment of the city of Ahmedabad. The Karma land of Gandhiji and the base city for the non-violent movement in the country. Ahmedabad can be called the industrial partner of Gujarat and also most important city for the western part of contry.

VI INTRODUCTION OF AHMEDABAD MUNICIPLE CORPORATION (A.M.C.)

Before the year 1831 the flood of the Sabarmati river washed away the coat which had been built around the city of Ahmedabad, then Collector Mr. Bordle called a meeting of common citizens on 21 April 1831 to rebuild the walls of the fort. In which 1 percent on certain items like ghee As much as the tax was levied, this raised a fund of ₹ 2 lakhs and the walls of the fort were also built. Thus the first municipality in the country was created, and in course of time Seth Ranchodlal Chhotalal was made the first President of Ahmedabad Municipality on 15th September 1885 and held the post till 1915. Then Ravshankar Bhaishankar Nanabhai was elected as the President. In 1935, the municipality completed its century. In the year 1950, the structural and administrative establishment of the Ahmedabad Municipal Corporation took place within the Bombay Provisional Act 1949.[14]

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The budget of Ahmedabad Municipal Corporation in the year 2021-22 is Approximately ₹ 5000 crore. There are very few metropolitan municipalities in India that have such a large budget. The main income source of A.M.C. is Government grant in lieu of octroi, grant, subsidy and non tax revnue income. Main expenditure of A.M.C. is on Eshtablish and Devlopment work in city area. During the year 2021-22, A.M.C.'s budget allocated ₹. 402 crore for solid waste management.[15]

Table No. 1 Income Revenue, Revenue Expenditure and Capital Expenditure

No.	Income / Expenditure	Detail	2019-20 (Crore ₹.)	2020-21 (Crore ₹.)	2021-22 (Crore ₹.)
1	Revenue and Special Provision	Door to Door Collection Charge Conservancy Tax Waste collection fee	63.02 172.46 0.05	55.75 171.14 O.040	110 201.67 0.2
		Total Revenue Income	3909.22	4497.53	5111.94
2	Expenditure and Special Provision	Society and Slum Clean-up Cost of City Garbage Collection	11.71 315.39	12.23 336.10	13.03 364.18
		Total Revenue Expenditure	3316.80	3994.56	3952.50
3	Capital Account	Solid Waste Management Project (Expenditure on machinery, weighing equipment, dumping site, dung gas plant)	1.40	2.09	7.10
		Transfer to Total Capital Account	2468.94	2266.22	2714.50

Source :- ahmedabadcity.gov.in/budget[16]

(Note - In the above table, only the income and expenditure related to solid waste management is given.)

According to A.M.C.'s budget, the revenue generated by conservancy tax and door-to-door collection is about 6.27% of the total revenue. In which according to the cost of sanitation, the tax revenue of street light-road-sewage is included. While the expenditure on solid waste management alone accounts for an average of 9.42% of the total cost. Out of the 402 crore budget which allocated to solid waste management, about 33 to 35% is spent on door-to-door operations, about 25 to 28% on garbage collection costs, and about 20% on garbage collection's machinery and maintenance.

Ahmedabad is the seventh largest waste generated city in India. Where 4100 metric tons of waste is collected from the city per day. Out of which 76.2% waste is collected only in road sweeping and door to door system. About 560 g/day per capita waste is generated in the city.[17]

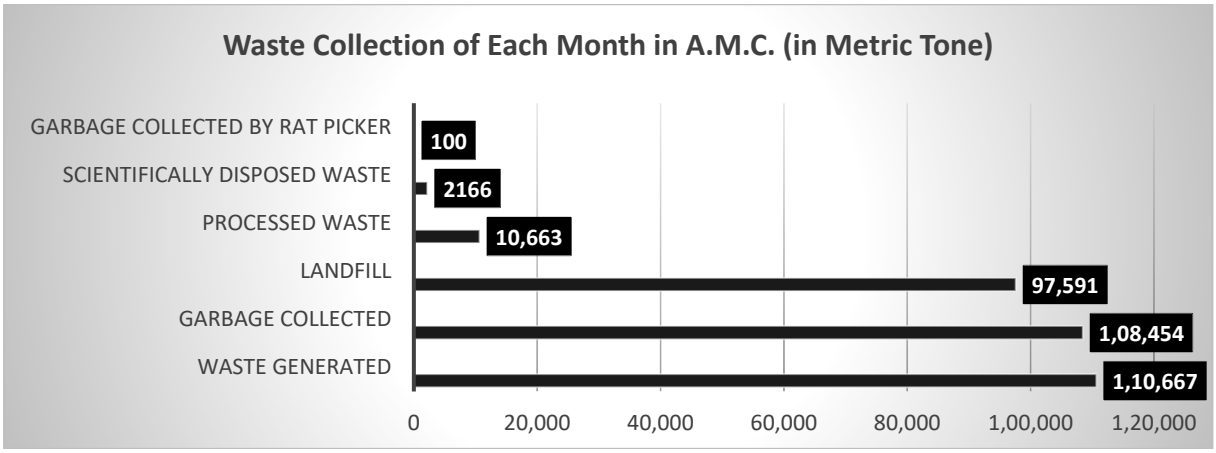

Fig. no 2 Waste Collection of Each Month in A.M.C. (Metric Tone)

Source :- Ahmedabadcity.gov.in[18]

Despite such a large management and budget, some problems related to solid waste have arisen in the last twenty years. Not only the collection of waste, but also the steps taken to dispose of it, still needs improvement. Keep these things in mind, the present research has emphasized the existing structure of solid waste management and willingness to pay of a citizen that defines solid waste and all related taxes? would a citizen choose to pay a tax for improved waste management? would a citizen choose to pay a tax for the disposal of their discarded things? Or is there any other solution?

VII Methodology of Study

Waste does not generated according to the person, but according to the household. One respondent means waste per household. According to the 2011 census, 11,79,823 families live in Ahmedabad city. According to the year 2021, Ahmedabad city includes a total of 15,86,080 households.[19]

1586080 households × 0.0001 = 158.60 = 159 Households

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Ahmedabad city is divided into six zones and 48 wards. The sample selection is divided according to the average proportion of household and waste generated into zones.

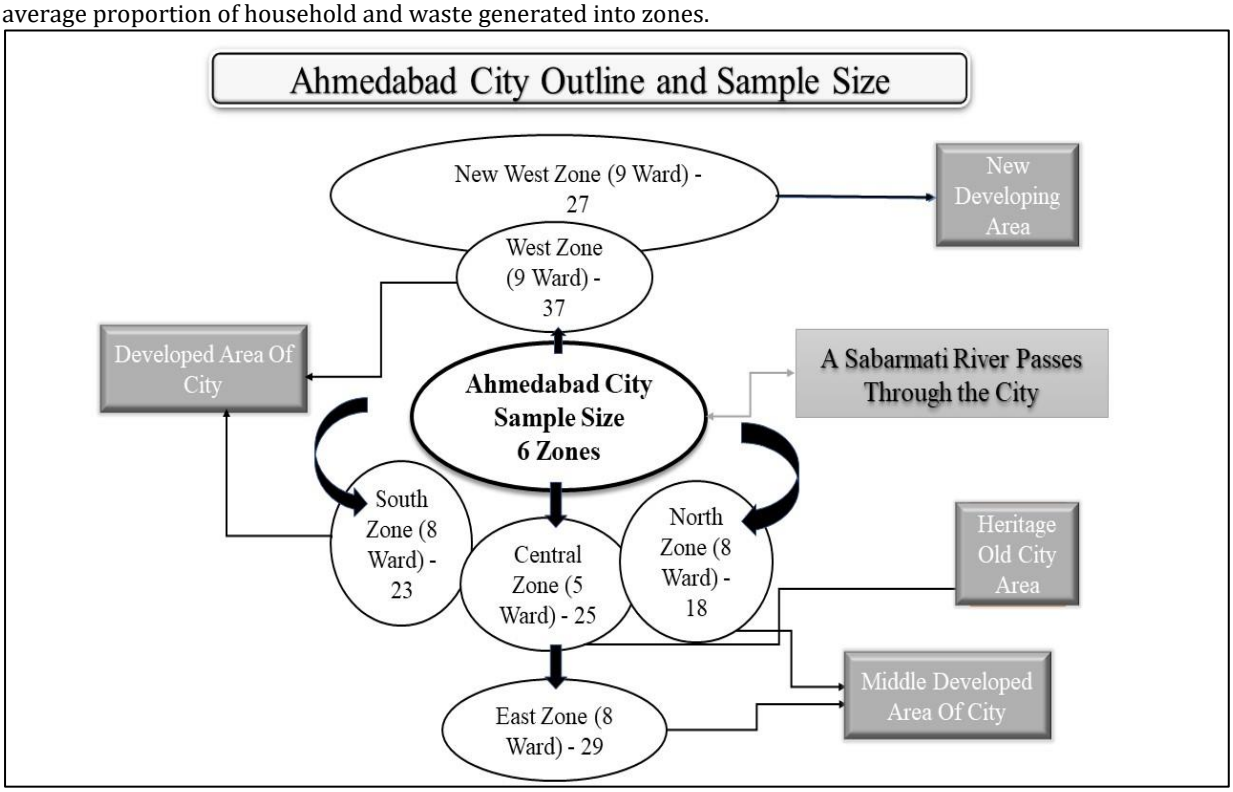

Fig. no 3 Ahmedabad City Outline and Sample

Size Source :- Field Survey

A total of 159 respondents were selected in this study. For the study purpose, a questionnaire was prepared. The questionnaire consisted of seven parts and 55 questions. Each part of the questionnaire asked questions about living and quality of life in the city.

A. In the first part, questions were asked about the socio-economic information of the respondent.

B. In the second part, the respondents were asked about the diseases they & their family members had suffered during the last three years.

C. In the third part, a response to the effects on residential property value was obtained.

D. In the fourth part, questions of drinking water and water quality were asked.

E. In the fifth part, questions were asked to know the residential situation of the city.

F. In the sixth part, general questions related to solid waste management were asked.

G. In the seventh part, study related questions such as are they willing to pay any amount for this management? And if yes how much? And how often?

The main objective of the study is to focus on willingness to pay for solid waste management. But since these questions are related to this problem, they are covered in the questionnaire. The answer that given by the responants was recorded in respective questionnaire.

(a) Regression module

According to secondary data, most of the researches that have been done on solid waste management through contingent valuation method are found to use Regression model. A regression can specify the actual effect of an independent variable on the dependent variable. Similarly, people who are willing to pay a price for solid waste management are paying for a reason. Keeping this in mind, the following model has been created.

WTP = f(Yi, Ihh, Edl, Fs, SWp)

Where, WTP = Willingness to Pay for Improved Solid Waste Management.

Yi = Years of living in Ahemedabad City.

Ihh = Household's Income.

Edl = Education Level Of Respondents.

Fs = Size of Family

SWp = Problems of Unmanaged Solid Waste.

$Y\ (WTP) = \beta 0 + \beta 1 Yi + \beta 2 Ihh + \beta 3\ Edl + \beta 4\ Fs + \beta 5 SWp + e$

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VIII RESULT AND DISCUSSION

Ahmedabad city generates 4100 metric tons of waste daily in which Both hazardous waste and medical waste are not included. they treated separately in their respective units. For the disposal of which contracts have been given to various organizations through Public Private Partnership. The type of waste that is then generated is non-hazardous and easily disposed of. The proportion of which is as per below.

Until 2018, waste collected through door-to-door and silver trolleys went directly to landfill sites. In subsequent years the waste released in the R.T.S. according to each zone is disposed of through a fixed process. While blocks and manhole covers are made from construction and demolition waste. Natural compost is made from hotel and kitchen waste. From the year 2019, dry waste and wet waste are collected separately from the city in Tata Norms Euro 4 vehicles. While things like cells, bulbs, tubes or blades are taken in a separate bin.

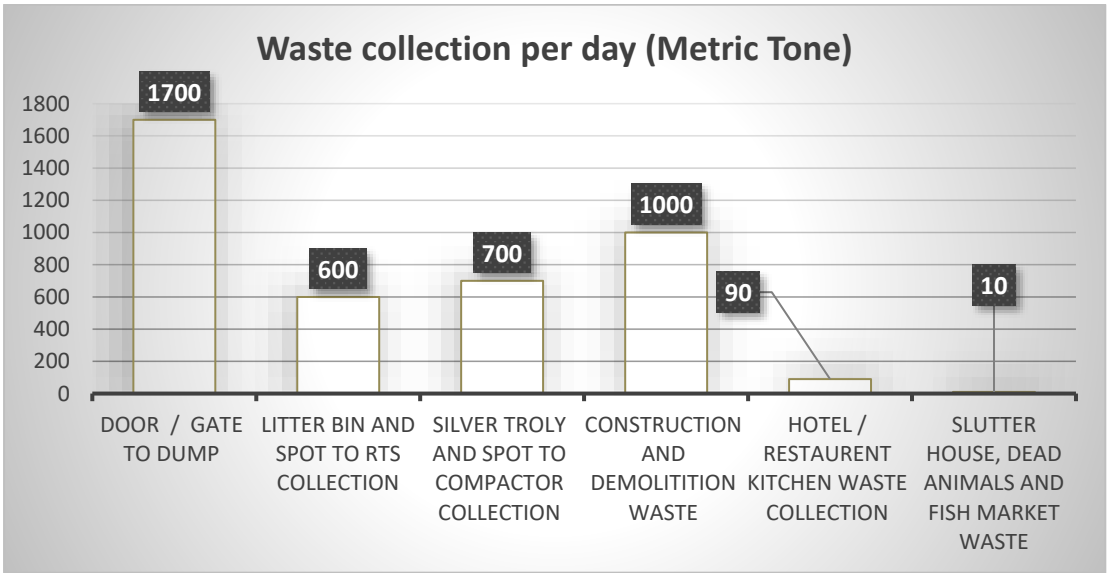

Fig. No. 4 Type Of Waste Generation In Ahmedabad City

Source :- ahmedabadcity.gov.in[20]

There is still room for improvement in this situation. Because despite such practices of separate waste collection, waste is collected together. If seen at the ground level, all this collected waste becomes almost impossible to separate. Apart from this, there is a higher chance of harming others while separating items containing electrical elements or some sharp items like glass pieces, bulbs or blades. The dry and wet waste collected in this way is finally deposited at the landfill site itself. This ultimately violates the 3R's policy and the waste becomes a hazard to some of the abandoned animals apart from the rag pickers. Over time, this waste releases methane gas into the air as it decomposes. Which has the property of burning with normal heat. Along with this, soil pollution, air pollution and groundwater pollution increases.

(a) Result of Logit Reggression module

In order to avoid these problems, the reggression model which is designed according to the purpose of the present research. It shows the relationship between willingness to pay of citizens and their socio-economic characteristics.

Table No. 2 Result of Logit Reggression module

Variable	Coefficient (β)	Std. E	T test	Sig.
Years of living in Ahemedabad City	.301	.780	2.094	.041
Household's Income	.015	.000	.109	.914
Education Level Of Respondents	.125	1.631	.958	.342
Size of Family	-.258	.658	-1.880	.065
Problems of Unmanaged Solid Waste	.013	.013	.094	.926
Constant	13.242	7.644	1.732	.089

Source :- Field Survey

$R^2 = .145$

Adjusted $R^2 = .068$

According to the reggression result, 14% of the variance of the dependent variable can be explained by the independent variables included in the model. In a way this model cannot be considered as successful. There is very little rrelation between W.T.P. and five independent variables, in which years of residence in Ahmedabad city, education of the respondent and W.T.P. are positively correlated. Whereas the rrelation between family

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income, solid waste problems and W.T.P. is close to zero. While the effect of family size and W.T.P. is negative. T test and significance value are also not efficient in this model.
This result only shows that many other factors play major role in a functioning management apart from just these five independent variable.

(b) **Response for W.T.P. & W.T.A.**

Tata norms vehicles have been introduced since 2009 to manage door to door garbage collection in ahmedabad city. From october, 2018, taxation has been started for this management. 0.50 paise for a house less than 30 sq.m. And ₹. 1 for more and ₹. 1 for a shop less than 50 sq.m. And ₹. 2 for more is currently charged. Also, the conservancy tax which includes water, sanitation, garbage and street light is around 6%.[21]

Table No. 3 Response of hoseholders For Willingness to pay and willingness to accept

No.		**W.T.P. (Range based on primary data Collection)**			**W.T.A. (Range based on Secondary Data from review of liturature)**		
		Detail (Month Wise)	Respondents	Ratio	Detail (6 Month Wise)	Respondents	Ratio
1	**Yes**	More than 30 ₹	24	15.09	More than 90 ₹	13	8.18
		20 ₹ Upto 30 ₹	19	11.95	60 ₹ Upto 90 ₹	44	27.68
		10 ₹ Upto 20 ₹	10	6.29	Less than 60 ₹	52	32.71
		Less than 10 ₹	9	5.66	According to A.M.C.	1	0.63
		Total	**62**	**38.99**		**110**	**69.18**
2	**No**	Can't pay	12	7.55	Can't pay	5	3.14
		Gov. has to pay	64	40.25	Gov. has to pay	32	20.13
		No trust in local Gov.	20	12.58	No trust in local Gov.	12	7.55
		Any other Reason	1	0.63			
		Total	**97**	**61.01**	**total**	**49**	**30.82**
3	**Total**		**159**	**100**		**159**	**100**

Source :- Field Survey

There were more respondents who would accept if the government imposed any tax than those who paid the tax. When respondents are asked to name a price they should pay, most of the time their answer is ₹. 30. 15.9% respondents were willing to pay ₹. 30 per month. When a range of prices was put before the same respondent, they accepted the lowest price.

Table No. 4 Stastical analysis For Willingness to pay and willingness to accept

Stastical analysis	**W.T.P.**	**W.T.A.**
Mean	22.0806	14.0909
Std. Error of Mean	.94712	.57825
Median	22.0000	10.0000
Mode	22.00[a]	10.00
Std. Deviation	7.45764	6.06471
Variance	55.616	36.781
Skewness	-.297	1.865
Std. Error of Skewness	.304	.230
Range	21.00	20.00
Minimum	10.00	10.00
Maximum	31.00	30.00
Sum	1369.00	1550.00

Source :- Field Survey

The price the respondents are willing to pay is more than what they accept. Even though the proportion of such respondent is low it can collect more funds for solid waste management. In a way, people who are willing to pay for solid waste management value the high price ₹. 30 or ₹. 31 per month. While those who accept the price, accept ₹. 60 for 6 months and ₹. 10 per month. Due to which the mean, median and mode of their calculated values are also low. Skewness in W.T.A. is positive and far from zero. Which means that this information is not evenly distributed. Whereas in W.T.P. this ratio is negative but close to zero.
Although the range of both the highest price and the lowest price is between ₹.10 and ₹.30, most of the people in W.T.P. choose Rs.30. While most of the people in W.T.A. accepted ₹.10.

IX CONCLUSION

How much is a citizen willing to pay to a corporation for proper disposal of solid waste in Ahmedabad city? This research was done on it. In this survey of 159 people out of 1586080 households, 38.99% people

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expressed their willingness to pay an explicit value. While 69.18% people were ready to accept the value fixed by the local government.

(a) Income for A.M.C. Throgh the method

W.T.P. = 1586080*38.99/100*30 ₹.(maximum) = 18552378 = ₹. 1.85 crore = ₹. 22.26 crore (for 12 month)
W.T.A.= 1586080*69.18/100*10 ₹.(maximum) = 10972500 = ₹. 1.09 crore = ₹. 13.16 crore (for 12 month)
(Note - Both ₹.30 and ₹.10 this value has been placed here because maximum people were willing to pay this value.)

Looking at this way, 38.99% people in Ahmedabad city were willing to pay an average amount of ₹. 22.08 for month and ₹. 264.96 per annum. While 69.18% people were ready to accept the amount of ₹.14.09 for month and ₹. 169.08 per annum.

12.86% of middle income earners were willing to pay the average value. While 3.11% people with high income were willing to pay below average price. The notion that people with higher incomes are willing to pay higher prices is refuted here.

One thing to note throughout this research is that, this entire management is already in place. In which no new arrangement has to be added. Already a charge under the vehicle of conservancy tax and door to door collection is levied by the corporation. However, the need for this study arose because the problem related to solid waste is huge in the city. Most of the waste that is collected is not recycled. The purpose of this study is to get the recycling process in motion. 78% Respondents Who runs the solid waste collection organization in the city? Don't know that. Along with this study some moral questions were asked to the respondent regarding solid waste management. In which more than 42% respondents consider the city environment to be poor. As many as 38.3% respondents consider the performance of A.M.C. as poor. Whereas according to 82.4% of them, they have support for solid waste management. A person's thinking is clear from these questions.

X POLICY IMPLICATIONS

A.M.C. is one of the largest budget and operating municipal corporations in India. Be it machinery, operations, personnel or network, everything is successfully carried out. However, many solid waste management practices have left a lot to be desired.

- 64.15% of the respondents keep their waste in a single dustbin despite the fact that wet and dry waste segregation has been in operation for many years. They reason that 'waste goes to one place' or 'takes in one container.' Such combined dry and wet waste cannot be separated. This slows down the recycling process. First of all, drivers of these Euro 4 vehicles need to be explained to separate wet and dry waste. However, if it does not happen, there is a need to take punitive action against this door-to-door organization.
- Solid waste management is already operational in A.M.C. Which does not need any funds to start a new one, but to make this management more efficient, the citizens along with the local government also need to understand this responsibility. Only 3.8% of the respondents were of the opinion that this management is their responsibility along with the government. Citizens need to be aware if this is the case. Only at the unit level if dry and wet waste is segregated, 25 to 30% of the waste can be directly recycled.
- 3p has gained more importance in this management of A.M.C. In which five-year contracts have been awarded to private companies for door-to-door management, hotel-restaurant kitchen waste management, construction and demolition waste management. But due to some mistakes all these organizations cannot work 100% successfully. Due to which there is more scope for reform in A.M.C rules and these private organizations.
- A.M.C. formed in 1950 as per B.P.M.C. Act 1949, the waste is owned by the local government, which should be disposed of only by the government. According to the Waste Management and Handling Rules 2000 and the latest 2016, solid waste should be disposed of according to the law. Despite both of these, solid waste was being disposed of in landfills till 2019. What happened the plan of waste to electricity, wet waste composting or natural waste composting plants? There is no information about it.
- The partial success of the regression model in the study can be attributed to the fact that there is no need to tax the common citizens until the A.M.C. make their management more operational and take the waste recycling activities in a proper direction. Here, not only the activity of waste collection, but also the systematic disposal of waste is given importance.
- Many of the best systems in solid waste management are no longer efficient by the time they come from the top level to the ground level. Like segregating dry and wet waste, distributing two dustbins among the citizens and many more.. So it is more necessary to take care of each level and make them work systematically.

XI LIMITATION OF THE STUDY AND FURTHER SCOPE

- It was sometimes very difficult to explain the purpose of study to common people. Any new tax for them means more trouble.
- When the respondent realized this, some people were unable to state their true income. some people estimate the willingness to pay more than necessary, because they do not have to pay this amount.

- As in every study on WTP, in this one those who estimated a price were only estimating for their own satisfaction. The only difference here was that 75 to 80% of the people included in the study were not aware that they already pay an amount for solid waste management.

(a) **Further scope in this topic for better judgement**

- There is a need to know the problems that arise in the ongoing management of solid waste management, especially the agreements that are made between both private companies and the government.
- Before knowing the willingness of people to pay taxes in solid waste management in the operating management, it is necessary to specifically check the taxes that are operating in the management in the corporation and the rate at which they are levied.
- Moral principles are largely ignored in economic social studies. But in every such research the importance of morals increases, because the individual plays a very important part in behavioral studies.

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Tricky Words

[1] A.M.C. – Ahmedabad Municiple Corporation
[2] R.T.S. – Refuse Transfer Station
[3] W.T.P. – Willingness To Pay
[4] W.T.A. – Willingness To Accept
[5] S.W.M. – Solid Waste Management
[6] B.P.M.C. Act - Bombay Provincial Municipal Corporations Act.
[7] 3R Policy – Reduse, Reuse, Recycle
[8] 3P Model – Public Private Parternership
[9] C.P.C.B. – Central Pollution Control Board