Research Article

INVESTIGATION ON THE PERCEPTION TOWARDS PRIVATIZATION OF SOLID WASTE MANAGEMENT AND PREFERENCE OF FINANCIAL MODEL

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ABSTRACT

The local bodies have been responsible for Solid Waste (SW) management services. However, over the years, various weaknesses in the institutional, financial and technical aspects, have led to inefficiency in the provision of services at various levels. These contracts with the increasing waste generation rates and environmental awareness among the general public. The local bodies are not collecting any fees and tax on SW management among the public. The local bodies are sharing a certain proportion of property tax to spend on SW management which is insufficient to manage the SW.

In the recent years, municipal solid waste departments have faced slack operating budgets, increasing operating costs, rising cost-of-replacement capital expenses and skyrocketing exposure to environmental liability.

Cities in developing and industrialized countries in general do not spend more than 0.5 percent of their per capita Gross National Product on Urban waste services. Expenditure in SWM also serves as a reliable proxy to service levels for collection and disposal. Maintenance and operation costs in low-income countries show that about 20 to 50 percent of city revenues are spent for SWM, while in high-income countries, it is 1 to 10 percent of their revenues. SWM costs less to governments of high-income countries because of private sector participation, high labour and vehicle productivity and greater efficiency. Those that take the plunge find many of the aforementioned headaches disappear.

This research paper investigates the privatization of local solid waste management in Coimbatore, focusing on the respondent's perception towards privatization of Solid Waste Management and their preference of financial model.

INTRODUCTION

Privatization of SWM

Over the last decade the municipal solid waste departments have faced slack operating budgets, increasing operating costs, rising cost-of-replacement capital expenses and skyrocketing exposure to environmental liabilitylead to global movement towards involving of the private sector in provision of SWM services. The real question facing of the local bodies is whether to hand over the SWM services to private people. What should be the regulated pricing on SWM services? And in what way can the social welfare and justice be maintained by the government in the privatization of SWM. Before answering all the three questions, the most important issue is whether the people are willing to privatize the SWM services. Hence the present study has made an attempt to analyze the people's willingness to privatize the SWM at five scales. The number of respondents with different degrees of favour on privatization of SWM is illustrated in Table 1.

Table 1 Opinion on privatization of SMW

Sl. No	Degree of favour on privatization of SWM	Number of respondents			Total
		LIG	MIG	HIG	
1.	Very high	45	83	52	180
2.	HIgh	63	96	26	185
3.	Moderate	42	86	16	144
4.	Low	27	34	14	75
5.	Very low	14	41	-	55
6.	Total	191	340	108	639

The important degrees of favour on privatization among the respondents are high and very high which constitute 28.95 and 28.17 per cent of the total respectively. The respondents with low and very low degree of favor on privatization constitute 11.73 and 8.61 per cent to the total respectively. The most important degree of favour on privatization among the LIG and

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MIG is high which constitutes 32.98 and 28.24 per cent to its respective total of 191 and 340 respondents. Among the HIG, it is very high which constitutes 48.15 per cent of its total.

Reasons for Privatization of SWM

The reasons for privatization may be related to the existing poor service, lack of response to the customer call by the public sector, environmental awareness, etc. The reasons are identified by previous studies (Mc. Fadden, 1976, Fullerton and Kinnaman, 1996; Hug and Adams, 1993) were tested in the present study. In total there are 17 reasons for privatization have been identified. The respondents are asked to rate the reasons at five-point scale on the basis of their attitude towards the reasons. The mean score of all reasons among the LIG, MIG and HIG have been computed separately to highlight the important reasons for privatization among the respondents. The one-way analysis of variance has been executed to analyze the significant difference among the three income groups regarding their attitude towards the reasons for privatization. The results are given in Table 2.

The highly rated reasons for privatization among the LIG are reliability and efficient complaint handling of private sector since their mean scores are 3.6943 and 3.6166 respectively. Among the MIG, these reasons are reputation of the private company and reliability of private service since their respective mean scores are 3.9691 and 3.8968 whereas among the HIG, these are reliability of private service and red-tapism in public service since their mean scores are 4.3142 and 4.2962 respectively. In total, the HIG are highly rating the various reasons for privatization than the MIG and HIG. Regarding the attitude towards the reasons for privatization, the significant differences among the three income groups have been noticed in the case of flexibility in timing, customized service by private agency, timely collection of wastages.

frequency of collection, volume-based tariff, reputation of the private company, dissatisfaction on the existing system, poor service in existing system, non-existence of any system in public agency and red-tapism in public service since their respective 'F' statistics are significant at five per cent level.

Important Reasons for Privatization

The scores on various reasons for privatization among the respondents have been included for Exploratory Factor Analysis (EFA) in order to enumerate the reasons in term of their importance. Before conducting EFA, the test of validity of data for factor analysis with the help of KMO measure of sampling adequacy and level of significance of chi-square satisfy the validity of data for analysis since the KMO measure is greater than 0.5 and the level of significance of chi-square value is at zero percent level. The executed EFA results in four important reasons. The (reasons) variables in each important reason, its reliability co-efficient, eigen value and the per cent of variation explained are shown in Table 3.

The enumerated four important reasons for privatization explain the reasons to the extent of 83.38 per cent. The most important reason for privatization is 'existing system' since its eigen value and the per cent of variation explained are 3.8616 and 28.11 per cent respectively. This 'existing system' consists of five reasons with the reliability co-efficient of 0.7224. The second and third important reasons are 'office methods' and 'collection system' since their eigen values are 3.0414 and 2.6962 respectively. The per cent of variation explained by these two factors are 20.68 and 18.42 per cent respectively.

The last factor identified by the factor analysis is 'service quality' since its eigen value is 1.9833. It consists of four reasons with the reliability co-efficient of 0.8321.

Table 2 Reasons for privatization

Sl.No.	Reasons	Mean score among customers			F-Statistics
		LIG	MIG	HIG	
1.	Reliability of private service	3.6943	3.8968	4.3142	1.5668
2.	Flexibility in timing	2.5669	3.2109	3.6049	3.2464*
3.	Customized service	3.0617	3.6244	4.1408	3.3961*
4.	Timely collection of wastages	2.9688	3.4942	4.2403	3.4082*
5.	Frequency of collection	3.2214	3.5908	4.0893	3.0044*
6.	Volume based tariff	2.4045	3.6999	4.1164	3.6021*
7.	Complaint handling of private system	3.6166	3.8234	3.8066	0.7368
8.	Responsiveness	3.5645	3.8686	3.9192	0.6919
9.	Easy procedure	2.8641	3.0341	3.5646	1.4568
10.	Reputation of private company	2.6779	3.9691	3.8183	3.4021*
11.	Dissatisfaction on existing system	3.0444	3.8142	4.1236	3.1199*
12.	Poor service in existing system	2.9193	3.6083	4.0863	3.3344*
13.	Non-existence of any system in public	2.6079	3.2344	3.8644	3.5161*
14.	Red-tapism in public service	2.7144	3.3969	4.2962	3.7334*
15.	Political intervention	3.0496	3.6868	3.9193	2.9161

* Significant at five per cent level

Table 3 Important reasons for Privatization

Sl.No.	Important Reasons	Number of variable	Crown-bach alpha	Eigen value	% of variation explained	Cummulative per cent of variation explained
1.	Existing system	5	0.7224	3.8616	28.11	28.11
2.	Office Methods	4	0.7609	3.0414	20.68	48.79
3.	Collection system	3	0.8114	2.6962	18.42	67.21
4.	Service quality	3	0.8321	1.9833	16.17	83.38

KMO Measure of Sampling Adequacy: 0.7331   Bartletts test of sphericity chi-Square:91.09*

Reliability and Validity of the Important Reasons

The reliability and validity of the factors in each important reason have been examined with the help of Confirmatory Factor Analysis (CFA). The convergent validity has been estimated with the help of the significance of standardized factor loading of the reasons whereas the construct validity is ratified with the help of composite reliability. The Average Variance Extracted (AVE) of the construct has been also computed. The results are given in Table 4.

Table 4 Reliability and validity of variables in each important reasons

Sl. No.	Important reasons	Range of standardized factor loading	Range of 't' statistics	Composite reliability	Average variance extracted
1.	Existing system	0.6454-0.9029	4.6818-14.1415	0.7309	61.42
2.	Office Methods	0.7217-0.8446	6.0899-12.6891	0.7817	54.88
3.	Collection system	0.7303-0.9114	6.4214-14.2917	0.8409	61.24
4.	Service quality	0.6768-0.9342	4.8027-15.6027	0.8724	69.39

The convergent validity of the reasons in each construct has been confirmed since the standardized factor loadings are significant at five per cent level. The standardized factor loading of the reasons in the construct vary from 0.6454 to 0.9342. Since the composite reliability of al constructs are greater than 0.5, the construct validity has been confirmed. The AVE of each construct has confirmed the validity and reliability of the constructs since the AVE of the constructs are greater than the minimum threshold of 0.5.

Discriminate Validity of the Constructs

The discriminate validity of the constructs has been examined with the help of inter correlation between the four Important reasons. The correlation matrix is given in Table 5

Table 5 Inter-relationship between important reasons

Factors	Existing system	Office Methods*	Collection system	Service quality
Existing system		-0.1817	-0.1033	.2017
Office Methods			-0.2247	.1386
Collection system				.1568
Service quality				

The correlation co-efficient between the constructs varies from 0.1033 to -0.2247. There is higher correlation between the office methods and collection system whereas the leaser correlation is noticed between the existing system and collection system. No correlation co-efficient is significant at five per cent level. It shows the discriminate validity among the constructs. It reveals that there is a mutual exclusiveness of the important reasons for privatization.

Respondents' Perception on Important Reasons for Privatization

The respondents' perception on important reasons for privatization is computed by the mean score of various factors in each important reason. The mean score of important reasons among the LIG, MIG and HIG has been computed to exhibit the level of opinion on the important factors for privatization among the respondents. Regarding the opinion on important factors for privatization, the significant differences among the three income groups have been examined with the help of one-way analysis of variance. The results are given in Table 6.

The highly regarded important reasons for privatization among LIG are service quality since its mean score is 3.4402. Among the MIG and HIG the important reason is service quality since its mean scores are 3.7966 and 4.1247 respectively. Regarding the perception on important reasons for privatization, the significant differences among the three income groups have been found in the perception on existing system, office methods and collection system since their respective 'F' statistics are significant at five per cent level.

Table 6 Level of opinion on Important reasons for privatization of SWM

Sl.No.	Important Reasons:	Mean score among			F-Statistics
		LIG	MIG	HIG	
1.	Existing system	2.8671	3.5481	4.0579	3.4869*
2.	Office Methods	2.8901	3.6316	3.8265	3.1302*
3.	Collection system	2.9190	3.4319	3.9782	3.0214*
4.	Service quality	3.4402	3.7966	4.1247	2.1089

- Significant at five per cent level.

Association between the Profile of Respondents and their Opinion on Important Reasons

The profile of the respondents may be associated with their opinion on important reasons for privatization. In order to analyze such association, profile variables included are gender, age, nativity, occupational background, family size, number of earning members per family, house-ownership, type of house and ASWL. The one-way analysis of variance has been employed to analyze such associations. The results are given in Table 7.

Regarding the perception on "Existing System", The significantly associating profile variables are age, occupational background, family size and ASWI since their respective 'F' statistics are significant at five per cent level. The significantly associating profile variables with the perception on office methods are age, occupation background number of earning members per family and ASWI whereas regarding the perception on collection systems, the significantly associating profile variables are age, occupational background, family size, number of earning members per family and ASWI.

The significantly associating profile variables with the perception on 'service quality' are age, occupational background, family size, number of earning members per family and ASWI since their respective 'F' statistics are significant at five percent level. The analysis reveals the importance of age, occupational background and ASWI in their perception on important reasons for privatization among the respondents.

Table 7 Association between profile of respondents and their opinion on privatization

Sl.No	Profile	F-Statistics			Service quality
		Existing system	Office methods	Collection system	
1.	Gender	2.1403	2.9144	3.2641	3.6566
2.	Age	2.5086*	2.8447*	2.9039*	2.5144*
3.	Nativity	2.5081	2.0443	2.6162	2.8616
4.	Occupational background	2.7339*	2.6344*	2.5034*	2.7311*
5.	Family size	2.7108*	2.0866	2.8184*	2.8336*
6.	Number of earning member per family	2.0686	3.1443*	2.9397*	3.1246*
7.	House ownership	2.1145	1.9692	2.0463	2.7546*
8.	Type of house	2.8908	3.1443	2.7365	3.1007
9.	ASWI	2.8684*	3.2408*	2.7369*	2.6266*

- Significant at five per cent level.

Impact of Important Reasons for Privatization on their Overall Degree of Favour for Privatization among the Respondents

The important reasons for privatization among the respondents exist system office methods, collection system and service quality. The perception on the important reasons may have its own influence on the degree of favour for privatization among the respondents. The included independent variables are the score on above said four important reasons whereas the score on the degree of favourfor privatization are 5,4,3,2 and 1 for very high, high, moderate, low and very low respectively. The multiple regression analysis has been administered to analyze the impact of independent variables on dependent variable. The fitted regression model is

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + e$$

Where Y - Degree of favour for privatization
X_1 - Score on existing system
X_2 - Score on office methods
X_3 - Score on collection systems
X_4 - Score on service quality
$b_1, b_2 ... b_4$ - Regression co-efficient of independent variables
a - Intercept and
e - Error term

Table 8 Impact of important reasons for privatization on the overall attitude towards privatization

Sl.No.	Important variables	Regression co-efficient			
		LIG	MIG	HIG	Pooled
1.	Existing system	0.1844*	0.2488*	0.2711*	0.2219*
2.	Office Methods	0.0968	0.1244	0.1908*	0.1017
3.	Collection system	0.1414*	0.1603*	0.2411*	0.1722*
4.	Service quality	0.0933	0.1443*	0.2603*	0.1649*
	Constant	0.5684	0.9368	1.3969	0.9774
	R2	0.7142	0.8142	0.6931	0.8346
	F-Statistics	0.4968*	10.9697*	7.6642	12.1461*

- Significant at five per cent level.

The impact of independent variables on dependent variable has been analyzed among LIG, MIG, HIG and also for pooled data separately. The results are given in Table 8.

The significantly influencing reasons on degree of favour for privatization among the LIG is existing system and collection system. A unit increase in the perception on above said reasons results in an increase in degree of favour for the privatization by 0.1844 and 0.1414 units respectively, among the MIG, these significant reasons are existing system, collection system andservice quality. A unit increases in the perception on above three reasons result in an increase in degree of favour for privatization by 0.2488, 0.1603 and 0.1443 units respectively. Among the HIGs, a unit increases in the perception on existing system, office methods, collection systems and service quality results in an increase in degree of favour for privatization by 0.2711, 0.1908, 0.2411 and 0.2603 units respectively. The changes in the perception on the reasons for privatization explain the degree offavour for privatization to the extent of 69.31 per cent.

Reasons for not Supporting Privatization

Out of 639 respondents, 236 respondents are not in favour of privatization. Out of the 236 respondents, 74.17 per cent are of LIG whereas the remaining are of MIG and HIG. Since there are some reasons for not supporting privatization among the respondents, they are asked to rate the reasons for not supporting privatization at five-point scale. The mean scores of each reason among the LIG, MIG and HIG have been computed separately (Table 9).

The highly viewed reasons for not supporting privatization among the LIG is higher tariff and profit motive of private since theirmean scores are 3.9144 and 3.7417respectively. Among the MIG, these are no consideration for poor and higher establishment cost and profit motive of private since their respective mean scores are 3,3911, 3.1443 and 3.0612.

Table 9 Reasons for not supporting privatization

Sl.No	Reasons	Mean score			F.Statistics
		LIG	MIG	HIG	
1.	Higher tariff	3.9144	3.2342	2.8616	3.1449*
2.	No consideration for poor	3.6608	3.3911	2.9011	3.3096*
3.	Profit motive of private	3.7417	3.0612	3.1441	2.3614
4.	No public welfare	3.3342	2.8611	2.4516	2.6869
5.	Higher establishment cost	2.5643	3.1443	3.6168	3.0144*

- Significant at five per cent level.

Regarding the perception on the reasons, the significant difference among the three income groups have been noticed in the case of perception on higher tariff, no consideration for poor and higher tariff, no consideration for poor and higher establishment cost since their respective 'F' statistics are significant at five per cent level.

Evaluation of Financial Model for SWM System

The finance model for SWM system represents the pricing of SWM. The pricing of essential Services fixed by the public service provider should be based on the public welfare in their mind. Even though, the local bodies are having several options to price on their SWM services to the people they are charging either flat rate on marginal cost pricing. The available pricing models for SWM have been identified from the review of previous studies (Billings and AG the, 1980,Fisher *et al*; 1995,Hewitt and Hanemam,1995and Revwick and Archibad, 1998). The identified pricing models in the present study are marginal cost pricing, full cost pricing, cost plus profit pricing, discriminatory pricing, volume-based pricing, service quality-based pricing and flat rate pricing. The respondents are asked to rate the above-said pricing at five point scale on the basis of their willingness. The mean score of each pricing among the LiG, MIG and HIG have been computed separately and shown in Table 10

The highly rated financial model for SWM among the LIG is flat rate pricing and marginal cost pricing since their mean scores are 3.8184 and 3.6817 respectively. Among the MIG, these two financial models are service quality-based pricing and volume-based pricing since their respective mean scores

model among each group of respondents and also among the different group of respondents.

Table 11 explains the mean score of various financial models among the different groups of respondents based on their gender, age, nativity and occupational background. The male respondents highly rate the service quality-based pricing since its mean score is 3.9616 whereas among the female respondents, it is flat rate pricing since its mean score is 3.9812. Regarding the choice of various financial models, the significant difference among the models have been noticed among the male and female respondents since their respective "F" statistics are significant at five per cent level. Regarding the evaluation of various financial models, the significant differences among the male and female respondents have been noticed in the case of cost plus profit pricing, service quality-based pricing and flat rate pricing since their respective'F' statistics are significant at five per cent level.

The respondents aged less than 30 years and between 30 and 40 years prefer the service quality-based pricing since their respective mean scores are 4.2183 and 3.9604. Among the respondents with the age of 41 to 50, 51 to 60 years and above 60 years it is marginal cost pricing since their respective mean scores are 3.7859, 3.9622 and 3.6759. Regarding the evaluation of financial model, the significant difference among the financial models has been identified among the respondents aged less than 30 and above 40 years. The significant difference among the different age groups of respondents has been noticed in the evaluation of all seven financial models.

Table 10 Rating on financial model for SWM system

Sl.No.	Basis of financial model	Mean score			F-Statistics
		LIG	MIG	HIG	
1.	Marginal cost pricing	3.6817	3.0684	2.6861	3.1441*
2.	Full cost pricing	2.4083	2.8144	3.6864	3.4089*
3.	Cost plus profit pricing	2.3366	2.6033	3.7233	3.8904*
4.	Discriminatory pricing	3.7442	2.5144	3.1144	3.6644*
5.	Volume-based pricing	2.5616	3.2868	3.9168	3.7336*
6.	Service quality based pricing	3.0444	3.3361	4.1248	3.8184*
7.	Flat rate pricing	3.8184	3.0445	2.6662	3.5651

- Significant at five per cent level.

Are 3.3361 and 3.2868. Among the HIG, these financial models are service quality-based pricing and volume-based pricing since their mean scores are 4.1248 and 3.9168 respectively. Regarding the attitude towards the financial models for SWM, the significant differenced among the three income groups have been identify in their perception on marginal cost pricing, full cost pricing, cost plus profit pricing, discriminatory pricing, volume-based pricing, service quality-based pricing and flat rate pricing since their respective "F" statistics are significant at five per cent level.

Profile of the Respondents and their Choice on Financial Model

Since the profile of the respondents has its own role in the choice of financial model for SWM among them the present study has made an attempt to analyze the level of preference on each financial model among the different group of respondents in each of their profile variable with help of its mean score. The one-way analysis of variance has been employed to analyze the significant difference on the evolution of financial

The urban respondents highly rate the service quality-based pricing whereas the semi-urban respondents rate the marginal cost pricing highly since their mean scores are 3.9603 and 3.4563. The rural respondents rate the flat rate pricing highly since its mean score is 4.2366. Regarding the evaluation of financial models, the significant difference among the seven models has been identified among the three groups of

Respondents separately. Regarding the evaluation of financial models, the significant differences among the three group of respondents based on their nativity have been identified in the evaluation of full cost pricing , cost plus profit pricing, discriminatory pricing, volume based pricing and flat rate pricing since their respective 'F' statistics are significant at five per cent level.

The respondents with private and government employment highly rate the marginal cost pricing since their mean scores are 3.6351 and 3.4903 respectively.

Table 11 Profile of respondents and their preference on finance model for SWM

Sl.No	Profile	Mean Score							F-statistics
		Marginal cost pricing	Full cost pricing	Cost plus profit pricing	Discriminatory pricing	Volume based pricing	Service quality based pricing	Flate rate pricing	
1	2	3	4	5	6	7	8	9	10
I	**Gender**								
	Male	3.3705	3.0751	2.9961	2.7461	2.9272	3.9616	2.8352	4.618*
	Female	3.567	2.3961	2.1341	3.4681	3.6861	2.1986	3.9812	3.7103*
	F-Statistics	0.9197	2.5082	3.1415*	2.4199	2.3316	4.1708*	4.0614	-
II.	**Age**								
	Less than 30	2.9688	3.9092	3.4149	3.6344	3.8564	4.2183	1.8056	6.8541*
	30-40	3.5059	3.4163	3.0452	3.5911	3.5616	3.9604	3.0166	1.2399
	41-50	3.7859	2.6869	2.7019	2.9422	3.1016	3.2625	3.1403	2.9904
	51-60	3.9622	2.1689	2.3392	2.3092	2.6869	2.9666	3.8586	4.1706*
	Above 60	3.6759	2.4142	2.1144	2.5969	2.9185	2.6141	4.0394	5.9081*
III.	**Nativity**								
	Urban	3.6715	3.2969	3.0415	3.2141	3.8909	3.9603	2.0627	
	Semi-Urban	3.4563	2.9163	2.8681	2.3297	3.0141	3.1144	3.3144	
	Rural	3.8842	2.2900	2.1961	3.5443	2.6586	3.1284	4.2366	
	F-Statistics	1.1427	3.1086*	3.8081*	3.7024*	3.1144*	4.5062	6.1717	---
IV.	**Occupational background**								
	Private employmen	3.6351	2.7681	2.7914	2.4232	3.3563	3.5457	2.9429	6.0339*
	Government employment	3.4903	2.7314	2.8182	3.2084	3.2091	3.2676	3.1443	2.1596
	Business	3.6646	3.0171	2.7617	3.3166	2.8684	3.1441	3.3068	2.5033
	Others	3.9567	2.8143	2.3396	3.8189	2.4091	2.5617	3.9696	4.1242*
	F-Statistics	3.8028	2.9193	2.5089	2.7611	3.6441	2.9099	3.3044	5.0261*
		0.5141	0.6021	0.4417	4.2172	3.8146	3.1719	3.0696	---

- Significant at five per cent level.

Table 12 Profile of respondents and their preference on financial model for SWM

Sl.No	Profile	Mean Score							F-statistics
		Marginal cost pricing	Full cost pricing	Cost pus profit pricing	Discriminatory pricing	Volume based pricing	Service quality based pricing	Flate rate pricing	
1	2	3	4	5	6	7	8	9	10
V	**Family size**								
	Upto 3	2.9318	3.2596	3.3361	2.5153	3.4194	3.7139	3.1514	7.0332*
	4-5	3.2856	2.8569	2.4723	3.2080	3.3370	3.1763	2.8365	4.1391*
	6-7	3.9144	2.4017	2.5462	2.8144	2.7334	2.6863	3.8604	5.3968*
	Above 7	4.3196	2.3596	2.4086	3.6861	2.4406	2.5092	4.1086	8.1442*
	F-Statistics	3.9091*	3.0616*	2.9969*	3.1447*	3.0061*	3.3096*	3.0199*	---
VI.	**Number of earning members per family**								
	One	3.9244	2.0481	2.3075	3.6341	2.4040	3.0141	3.8284	8.0443*
	Two	3.7196	3.0845	2.8036	2.7864	3.4948	3.5111	2.9518	2.9091
	More than two	2.8823	3.6026	3.2233	2.3463	3.6339	3.6816	2.8661	4.5162*
	F-Statistics	3.1446*	3.7174*	2.7192	3.2641*	3.3441*	3.9024*	3.2161*	---
VII.	**House ownership**								
	Owned house	3.4211	3.3031	3.1969	2.7662	2.4566	3.1026	3.6063	3.1406*
	Lease	3.0446	2.6542	2.1605	2.5450	3.5102	3.3062	3.4301	3.0239*
	Rental	4.1686	2.4824	2.5054	3.3964	3.7129	3.6857	2.7302	4.1734*
	F-Statistics	3.2091*	2.9969	3.0141*	2.5617	3.5156*	1.9891	2.8686	---
VII	**Type of House**								
	Individual	3.9863	2.2175	2.1116	2.3634	2.5309	2.9071	3.8962	5.0869*
	Apartments	3.4328	3.2622	3.1199	3.4032	3.6137	3.7039	2.7483	1.4542
	F-Statistics	1.1454	3.0146*	3.1443*	3.2144*	3.1089*	2.5146	3.3145*	---
IX	**ASWI**								
	<21	4.5618	2.7451	2.8275	2.7625	2.9172	3.0162	3.4636	7.1403*
	21-40	3.0445	2.7516	2.7941	3.1456	3.1211	3.2044	3.0991	2.3319
	41-60	2.8033	2.9084	2.3962	2.9968	3.5054	3.3386	2.9417	1.9416
	61-80	2.6562	3.3391	2.4103	3.4102	4.1086	3.9099	2.8332	2.9969*
	Above 80	2.4511	3.8682	2.3019	3.7147	3.9968	4.1341	2.6411	5.0863*
	F-Statistics	5.1408*	3.1417*	2.0661	3.0671*	3.4502	3.1496*	2.8182	----

*Significant at five per cent level

The respondents engaged in business and agriculture highly rate the marginal cost pricing and flat rate pricing since their respective mean scores are 3.6646 and 3.9696. The respondents with other occupations highly rate the marginal cost pricing.

The significant difference in the evaluation of seven financial models have been seen among the respondents with private employment, agriculture and others. Regarding the evaluation of financial models, the significant differences among the respondents with private employment, agriculture and others.

Regarding the evaluation of financial models, the significant differences among the respondents with different occupations have been identified in the evaluation of discriminatory price, volume-based pricing, service quality-based pricing and flat rate pricing.

The evaluation of the financial models by the different groups of respondents based on their family size, number of earning members per family, house-ownership, type of house and ASWI has been analyzed and shown in Table 12.

The most important financial model identified by the respondents with the family size of upto 3 and 4 to 5 members is service quality-based pricing and volume-based pricing since their respective mean scores are 3.7139 and 3.3370. Among the respondents with the family size of 6 to 7 and above 7 members, this is marginal cost pricing since its mean scores are 3.9144 and 4.3196 respectively. The significant difference among the various group of respondents based on their family size have been noticed in the evaluation of all seven financial models.

The respondents with one and two earning members per family highly rate the marginal pricing since their respective mean scores are 3.9244 and 3.7196. The respondents with more than two earning members per family highly rate the service quality-based pricing since its mean score is 3.6816. The significant difference among the evaluation of seven financial models has been identified among the respondents with one and more than two earning members per family. The significant differences among the three group of respondents have been noticed in the evaluation of marginal cost pricing, full cost pricing, discriminatory pricing, volume-based pricing; service quality-based pricing and flat rate pricing.

The respondents living in owned house and leased house highly rate the flat rate pricing since its mean scores are 3.6063 and 3.4301 respectively. The respondents living in rented house highly rate the marginal cost pricing since its mean score is 4.1686. Regarding the evaluation of financial models, the significant difference among the three group of respondents have been noticed in the evaluation of marginal cost pricing, full cost pricing, discriminatory pricing, volume-based pricing. The respondents living in individual house highly rate the marginal cost pricing whereas the respondents in apartment highly rate the service quality-based pricing since their respective mean scores are 3.9863 and 3.7039. The significant differences among the two group of respondents have been identified in the evaluation of full cost pricing, cost plus profit pricing, discriminatory pricing, volume-based pricing and flat rate pricing. Among the respondents in individual house, the significant differences on the evaluation of seven pricing has been identified.

The highly rated pricing among the respondents with the ASWI of less than 21 per cent, 21 to 40 and 41 to 60 per cent are marginal cost pricing, service quality-based pricing and volume-based pricing since their mean scores are 4.5618, 3.2044 and 3.5054 respectively. Among the respondents with

The ASWI of 61 to 80 and above 80 per cent it is volume-base pricing and service quality-based pricing since their mean scores are 4.1086 and 4.1341 respectively. The significant differences among the evaluation on seven financial models

have been noticed among the respondent with the ASWI of less than 21 per cent, 61 to 80 and above 80 per cent. The significant difference among the respondents with different ASWI have been identified in the evaluation of marginal cost pricing, full cost pricing, discriminatory pricing, volume based pricing and service quality-based pricing.

Contingent Valuation Model (CVM)

The Contingent Valuation Model elicits the consumers' willingness to pay (WTP) for different service options. The contingent valuation method describes an ideal system to the customers, where the services of SWM would be at their maximum levels. The willingness-to-pay (WTP) for a proposed improved SWM services to the consumers has to be measured among the respondents. Usually, the survey of discrete choice experiments is used to value attributes of SWM options. Several designs options generated in choice model are used here also. The only difference is that the respondents are asked to mention their willingness-to-pay for each model generated is choice model by an addition (Kabana and Jair 2001, Boxall *et al*;1996, Van and Morris, 1999). In the present study, the WTP of the respondents has been measured for the proposed enriched SWM services in general The respondents are asked to mention their WTP in near future for SWM services. The results are given in Table 13.

The important WTP among the respondents for SWM services per month is Rs. 101 to 125 and Rs. 76-100, which constitutes 21.28 and 16.43 per cent of the total respectively. The respondents with the WTP of above Rs. 200 per month constitute 8.76 per cent to the total. Among the LIG, the important WTP are uptoRs. 50 and Rs 51 to 75 which constitute 36.13 and 20.42 per cent of its total. Among the MIG, these are Rs.101 to 125 and Rs. 126 to 150, which

Table 13 Willingness to pay for SWM per month

Sl.No.	Willingness to pay (in Rs)	Number of respondents			Total
		LIG	MIG	HIG	
1.	Upto 50	69	12	-	61
2.	51-75	39	46	7	92
3.	76-100	36	58	11	105
4.	101-125	25	90	21	136
6.	126-150	13	65	23	101
7.	Above 200	---	27	29	56
	Total	191	340	108	639

Constitutes 26.47 and 19.12 per cent of its total respectively. The important WTP among the HIG are above Rs. 200 andRs. 126 to 150 which constitutes 26.85 and 21.29 per cent of its total respectively.

Profile of the Respondents and their WTP

The WTP for SWM services per month may be associated with the profile of the respondents since the socio-economic and demographic characteristics of respondents play an important role in specifying the WTP for SWM among the various groups in each profile of the respondents is given in Table 14.

The male respondents are willing to pay more than the female respondents since their respective mean values of WTP are Rs. 129.11 and Rs. 64.97. The significant difference among the male and female respondents has been identified regarding their WTP on SWM services. The same situation is also noticed among the various age groups of respondents. The

respondents aged less than 30 years are willing to pay a mean of Rs.141.08 whereas the respondents with the age of above 60 years is willing to pay a mean of Rs. 58.62 only per month on the SWM services. The mean of urban respondents' WTP

Among the farmers, it is only Rs. 56.72. Regarding the WTP, the significant differences among the respondents which different occupational background have been noticed since their respective 'F' statistics is significant at five per cent level.

Table 14 Profile of the respondents and their willing to pay of the for SWM per month

Sl.No.	Profile	Mean	Standard deviation	Co-efficient or variation	F-Statistics
I.	**Gender**				
	Male	129.11	34.28	26.55	6.8894*
	Female	64.97	10.04	15.45	
II.	**Age**				
	Less than 30	141.08	21.77	15.43	
	30-40	130.66	22.08	16.89	
	41-50	119.93	17.39	14.50	8.0846*
	51-60	74.69	12.64	16.92	
	Above 60	58.62	8.19	13.97	
III.	**Nativity**				
	Urban	139.43	20.04	14.37	
	Semi-Urban	114.39	16.61	14.52	5.0114*
	Rural	68.93	9.09	13.19	
IV.	**Occupational background**				
	Private employment	120.39	17.14	14.24	
	Government employment	108.62	22.49	20.70	
	Business	127.09	26.06	20.51	6.6734*
	Agriculture	56.72	7.46	13.15	
	Others	82.03	10.08	12.29	

- Significant at five per cent level.

For SWM per month is Rs. 139.43 whereas among the semi-urban and rural respondents, it is Rs. 114-39 and Rs. 68.93 respectively. Regarding the WTP of three groups of respondents, the significant difference among them have been noticed since their respective 'F' statistics is significant at five per cent level.Based on occupational background, the respondents with private employment are willing to pay a mean of Rs. 120.39 per month for SWM services whereas the government employees and businessmen are willing to pay Rs. 102.62 and Rs. 127.09 respectively.

The association between the profile variables namely family size, number of earning members per family, house-ownership, type of house and ASWI and the WTP among the respondents have been examined with the help of mean, standard deviation, co-efficient of variation of WTP and its respective 'F' statistics. The results are given in Table 15. For respondents with the family size of upto 3 members and 4 to 5 members, the mean of WTP for SWM services per month is Rs. 112.11 and 120.83 whereas among the respondents with different family size have been noticed whereas the same trend

Table 15 Profile of respondents and their willing to pay for SWM per month

Sl.No.	Profile	Mean	Standard deviation	Co-efficient of variation	F-Statistics
I	**Family size**				
	Upto 3	112.11	16.79	14.98	
	4-5	120.83	19.33	15.99	
	6-7	86.94	10.69	12.29	4.6684*
	Above 7	67.69	8.44	12.46	
II	**Number of earning members per family**				
	One	100.36	`14.44	14.39	
	Two	100.89	10.69	10.59	3.9145*
	More than two	149.03	13.31	8.93	
III.	**House Ownership**				
	Owned House	88.31	10.14	11.48	
	Leased	117.79	8.33	7.07	3.0633*
	Rented	122.44	14.45	11.80	
IV.	**Type of house**				
	Individual	71.04	9.33	13.13	3.2142*
	Apartments	133.08	12.69	9.54	
V	**ASWI**				
	Less than 21	89.90	8.11	9.02	
	21-40	104.45	17.45	16.71	
	41-60	129.07	16.39	12.69	4.1142*
	61-80	142.69	18.41	12.90	
	Above 80	153.34	21.46	13.99	

- Significant at five per cent level.

is identified among the respondents with different earning members per family. For respondents with one earning member per family, the mean of WTP is Rs. 100.36 whereas it is Rs. 149.03 among the respondents with more than two earning members per family.

The mean of WTP among the respondents in owned house and leased house is Rs. 88.31 and Rs. 117.79 respectively. Among the respondents with rented house, it is Rs. 122.24. The respondents living in individual house are willing to pay a mean of Rs. 71.04 whereas for those who are living in apartments, it is Rs. 133.08. Regarding the WTP, the significant differences among the respondents have been identified when they are classified on the basis of house-ownership and type of house.

The ASWI plays an important role in the WTP among the respondents. The respondents with an ASWI of less than 21 and 21 to 40 percent are willing to pay a mean of Rs. 89.90 andRs. 104.45 for SWM respectively. The respondents with an ASWI of above 80 and 61 to 80 per cent are willing to pay a mean of Rs, 153.34 and 142.69 respectively. The significant 'F' statistics reveals that there is a significant difference among the respondents with different ASWI regarding their WTP on SWM services.

When considering privatization, most communities discover not only that they are capable of reducing operating costs, but also that, after making the switch, they are able to expand services for less. This might include more curbside recycling options, building new material recovery facilities and landfill operations. Landfill operations alone could include buying out and operating an existing site or designing, permitting and operating a new landfill for the municipality. The intangibles that the private sector provides includes educated and experienced staff, continuous and updated training, best industry practices and environmental knowledge.

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