

**SHIV SHAKTI**

**International Journal of in Multidisciplinary and  
Academic Research (SSIJMAR)**

**Vol. 4, No. 3, June 2015 (ISSN 2278 – 5973)**

**Full Cost Analysis of Municipal Solid Waste Management: A Study with  
Reference to Mysore City Corporation on PPP Basis**

**\*Dr. Veena K.P.**

\*Associate Professor, Dept. of Master of Business Administration (MBA), Visvesvaraya Technological University, Post Graduate Studies, Mysore Regional Centre, Mysore – 570029, Karnataka.

**\*\* Ms. Shilpa D.**

\*\*Research Scholar, Dept. of Master of Business Administration (MBA), Visvesvaraya Technological University, Post Graduate Studies, Mysore Regional Centre, Mysore – 570029, Karnataka.

**Impact Factor = 3.133 (Scientific Journal Impact Factor Value for 2012 by Inno Space Scientific Journal Impact Factor)**

Global Impact Factor (2013)= 0.326 (By GIF)

**Indexing:**



## **Abstract**

The concept of full cost analysis is a systematic approach for identifying and determining, all the cost of municipal solid waste management systems. It involves the identification and inclusion of all direct and indirect costs associated with providing a particular service or program. This paper includes the process of full cost analysis which helps Mysore City Corporation understand expenditures associated with collection, disposal, and recycling so that the true costs and reimbursement of each service are understood. This paper focused on the significances and scope of the municipal solid waste management on the basis of public private partnership and also to critical examination of the infrastructure and improvement cost required to development of municipal solid waste management system in Mysore City. The study further focuses on the estimation of primary collection cost and secondary collection cost incurred to manage municipal solid waste management. The study has been conducted through interview of Puvrakarmikas worked under the project of land filling it has been run under the public and private partnership Mysore City Corporation (MCC), Mysore. Finally the study concluded that this approach helps local governments identify all current costs associated with solid waste management such as collection charges, transportation cost, process or recycle cost, and disposal charges are account for past and future expenses for which benefits are realized in the current budget year.

*Keywords: Full Cost Analysis, Municipal Solid Waste Management, Public Private Partnership, Recycling and Disposal Cost.*

# **Full Cost Analysis of Municipal Solid Waste Management: A Study with Reference to Mysore City Corporation on PPP Basis**

**\*Dr. Veena K.P.**

Email: [kpveenamurthy@gmail.com](mailto:kpveenamurthy@gmail.com)

**\*\* Ms. Shilpa D.**

Email: [shilpad1989@yahoo.com](mailto:shilpad1989@yahoo.com)

## **Introduction:**

The occurrence of solid waste management concept is a big challenge all over the world for human beings. The problem of Municipal Solid Waste Management (MSWM) is also prevailing in the urban environment of Mysore. The rapid growth of population in a city leads to increasing demands for solid waste management and also larger area for disposal of effluent and toxic waste from different sources. Management of solid wastes is one of the critical issues for the urban areas of developed and developing countries. The tasks of solid-waste management present complex technical challenges. This concept includes a wider concept of costs incurred for managing the process of solid waste management.

The present study area has been cover in this paper; a composting plant was set up under the ADB assisted Karnataka Urban Infrastructure Development Project at Vidayranya Puram to generate compost from the city refuses. The plant is located about 6 Km from the Mysore city within an areas of 12.5 acres The plant was set up by the Excel Industries and was being operated by M/S Vennar Organics till June 2005. The plant has been operational at sub optimal levels and as of then the agency stopped operation. Now MCC is operating the Excel plant itself. The plant has the capacity to handle 200 tons of waste per day. The remaining waste is being dumped besides the Excel plant. Under the JNNURM project handling on PPP basis in JASCO. PPP it means "a partnership between a public sector entity and a private sector entity for the creation and management of infrastructure for public purpose for a specified period of time on commercial terms and in which the private partner has been procured through a transparent" to

---

\*Associate Professor, Dept. of Master of Business Administration (MBA), Visvesvaraya Technological University, Post Graduate Studies, Mysore Regional Centre, Mysore – 570029, Karnataka.

\*\*Research Scholar, Dept. of Master of Business Administration (MBA), Visvesvaraya Technological University, Post Graduate Studies, Mysore Regional Centre, Mysore – 570029, Karnataka.

provide a detailed analysis of the factors that determine full cost and solid waste service costs. attention is focused on municipalities of the 64 wards in Mysore city.

Full Cost Analysis is that it provides accurate and complete information on the real costs of managing solid waste. It uncovers hidden and overlooked costs and allocates all costs to the specific program for which they are incurred. As a result, managers are able to compare current and proposed services accurately, predict future costs reliably, and evaluate privatization options thoroughly. In short, full-cost analysis allows elected officials and solid waste managers to make informed decisions regarding the types and levels of solid waste services. In addition to the general advantages that come with understanding program costs.

### **Current Scenario of Municipal Solid Waste Management in India:**

Municipal Solid Waste is generally termed as “unwanted or undesired “material. Though the term is universal it has different concern depending upon the location and living standard of people. According to Indian MSW, Rules 2000 "Municipal Solid Waste “includes commercial and residential wastes generated in a municipal or notified area in either solid or semi-solid for excluding industrial hazardous wastes but including treated bio-medical wastes. India’s population as per 2001 census is 1027 million, of which 285.3 million people live in 5161 urban areas. The problem of urban waste management is noteworthy not only because of large quantities of waste but also due to its spatial spread across 5161 Urban-Local-Bodies and a variety of problems faced in setting up for systems for collection, transportation and disposal of waste.

### **Significance and Scope of Solid Waste Management:**

**The significance and scope of solid waste management are as follows:**

- Municipal Solid Waste Management (MSWM) is major responsibility of local government. It is a complex task which requires appropriate organizational capacity and cooperation between numerous stakeholders in the private and public sectors.
- It is essential to public health and environmental protection, solid waste management in most cities of developing countries is highly unsatisfactory.
- Municipal solid waste management is refuse from households, non-hazardous solid waste from industrial, commercial and institutional establishments (including hospitals), market

waste, yard waste and street sweepings. MSWM encompasses the functions of collection, transfer, treatment, recycling, resource recovery and disposal of municipal solid waste

- The main aim of MSWM is to protect the health of the population, particularly that of low income groups. Other goals include promotion of environmental quality and sustainability, support of economic productivity and employment generation.
- Storage of Waste: Waste storing practice was at low ebb. Almost 45.00 per cent of the households and 80.00 per cent of shops and establishments strew waste on the streets
- Segregation of recyclable waste was hardly practiced. Around 91% citizens did not segregate waste at source.
- Collection at Source: 44.00 per cent of the households were covered under door-to-door collection
- In Mysore urban area that is 157500 k.m and 72.00 per cent of the streets were swept regularly Secondary collection system; Almost 85.00 per cent of waste storage depots were open rendering it unhygienic.
- Transportation of Waste: Almost 91.00 per cent of waste was being collected on a day-to-day basis. However, about 46.00 per cent of the waste generated was transported in open vehicles.
- Treatment & Disposal: The waste treatment and disposal practice was pathetic.MCC lacked in having any system for treatment or scientific disposal of waste.
- Status of Infrastructure: MCC was managing waste handling with the help of containerized hand carts, single bin lifters, refuse collector Lorries and tipper Lorries.

### **Statement of the Problem:**

Solid waste management issues are a highly emotive topic. The plant has been operational at sub optimal levels as public and private partnership and some of the agency stopped operation. Delay in sanction of budget for solid management, there is need high actual budgets require manage all the activities the main problem they facing shortage of funds such as primary and secondary cost, infrastructure development cost, transportation costs, Disposal costs need to be balanced all the expenses incurred to manage against available actual budget on the basis of public private partnership. To highlight of the study was undertaken “Full Cost Analysis of Municipal Solid Waste Management in Mysore City Corporation”.

## **Need for the Study:**

Now a day's solid waste management is becoming huge problem for human beings as well as environment. So it is necessary to adopt scientific method in municipal solid waste management. This requires financial budgets to require manage all expenses incurred to complete solid waste management process. So that, this study contributes financial and full cost analysis related information to upgrade the Mysore City Corporation have a valuable planning tool preparing budgets and determining a program's direction explore the incorporation of financial incentives into solid waste management programs. The public can also benefit from full cost analysis information. Full cost results can be presented to the public through the newspaper, tax forms, or other avenues to make solid waste cost and fees more transparent. With such information, citizens can better evaluate their own actions and the choices of their publics.

## **Review of Literature:**

**Howes and Hunt (1997)** conducted a study on the results of full cost analyses of solid waste management for a sample of North Carolina local governments. The study examined average cost per ton and cost per household and also compares solid waste costs to population. This study shows that there is a strong positive correlation between recycling rates and low recycling costs for the 15 participating local governments.

**Lester (1999)** mentioned the municipal solid waste recycling issue and they reported that Municipal solid waste (MSW) recycling targets have been set nationally and in many states but unfortunately, the definitions of recycling, rates of recycling, and the appropriate components of MSW vary. They found that MSW recycling has been found to be costly for most municipalities compared to landfill disposal. From the study they concluded that MSW recycling policy should be determined by the cost to the community and to society more in general.

**Yedla and Kansal (2003)** focused on a study to determine the critical examination of the existing MSW management system in Mumbai and Cost-Benefit Analysis (CBA) of the MSW management system in Mumbai, with emphasis on various implicit costs and benefits. They suggested that the current system of waste management in Mumbai is found to be inefficient.

There is a need for improvement in structure, organization and efficiency of both the formal and the informal waste management sectors in Mumbai.

**Garg, Kumar and Verma (2007)** emphasized a study that the paradigm shift that has been brought about in the sphere of solid waste management with the advent of public private partnership. Findings of the study show that the workers are suffering from several health problems. They arrived at a conclusion that waste management was one of the most poorly managed civic activity which has transformed into one of the most well managed one.

**Bel and Fageda (2008)** indicates in their study that economies of scale in municipalities of fewer than 50,000 inhabitants, such that cooperation between these municipalities could lead to cost savings. They concludes that the setting up of cooperation agreements between municipalities may reduce service costs for those with small populations, insofar as they would make it possible to take advantage of economies of scale.

**Chandra and Devi (2009)** conducted a study on Municipal Solid Waste Management in Mysore city. The aim of the study was to find out the problems and prospects of Municipal solid waste in Mysore city. The study covers various topics such as sources of solid waste management, distribution, transaction and disposal of waste. They conclude that the solid waste management in Mysore city appears to be inadequate and needs up gradation.

**Rode (2011)** undertook a study on Public private partnership in solid waste Management in municipal corporations of Mumbai metropolitan region. Researcher focused Solid waste is an integral part of modern society. Human activities create solid waste and it required to store, collect and dispose. If it is not properly managed then it causes risk to environment and public health. So they suggest that municipal corporations must adopt scientific methods for collection, segregation and disposal of solid waste. Municipal corporations must accommodate private sector for investment and management of solid waste. Urgent steps in this direction will reduce the water, air, soil pollutions and health hazards.

**Basavarajappa, Manjunatha and Balasubramanian (2013)** focused on a study with an objective to delineate the safe disposal sites of municipal & industrial wastes in the city of Mysore, Karnataka, India through Remote Sensing (RS) and Geographical Information System (GIS) along with ground level data. They suggested that the city waste should go from open dump to recycling at the source directly. Sorting of wastes from city at the source level, allows the incineration of residuals minimizing the environmental burden.

**Manohara and Belagali (2014)** submitted a research paper on the essential plant nutrients and heavy metals during the degradation process. Findings of the study highlighted that the generation of municipal waste both garbage and sewage has been on the rise. Anthropogenic activities in society generate large quantities of wastes posing a problem for their disposal. The concentrations of essential plant nutrients were found to be under the limits of Ohio- EPA standards and Canadian Council of Ministers of the Environment (CCME) standards. Heavy metals were also found in trace quantities and humification process caused decrease in heavy metal concentration.

### **Scope of the Study:**

The present study is conducted to examine the solid waste management on the basis of public private partnership in Mysore City Corporation, Mysore. The analysis includes the private sector participation in solid waste management commercial and residential wastes generated in municipal or notified areas. The scope of this report is confined to municipal solid waste management over all full cost analysis incurred is carried out, with due consideration for implicit or hidden costs and benefits. Total cost incurred on quantity of MSW transported to disposal sites, municipal solid waste management services provided scientifically method as to followed through trash haulers, transfer stations, recycling facilities, trash-to-energy facilities on land filling merge functioning of public and private partnership.

### **Objectives of the Study:**

The following are the major objectives of the study:

- a) To highlight the significances and scope of the municipal solid waste management in Mysore;
- b) To Critical examine the infrastructure and improvement cost required for the development of municipal solid waste management system in Mysore;
- c) To estimation of primary and secondary collection costs incurred to manage municipal solid waste management;
- d) To assess the transportation cost required to manage municipal solid waste management.

- e) To analyze the recycle and disposal cost required to manage municipal solid waste management; and
- f) To provide useful suggestions in the light of the study.

### **Research Methodology:**

The data required for the present study has been collected from both primary and secondary sources of data collection. Primary data collection is done through administering questionnaires, conducting face-to-face interviews and by observation within the area of study. Secondary sources of data collected, insights were gathered from practitioners of Public Private Partnerships full cost information of solid waste management, through a number of primary interviews and focused group discussions. Here four solid waste management projects undertaken on the basis of PPP mode were chosen and the issues faced by stakeholders running solid waste management compost plant, In other side to secondary research, annual publications, bulletins, trends and progress reports Mysore City Corporation declared budget reports and tender reports provided by JASCO and Excel plants. In addition to these books, articles published in journals, thesis submitted to the universities and working papers of various institutions also considered. Internet and other sources also used to light of the study. The analysis and interpretation of data is done using percentages and graphical representation.

### **Analysis and Interpretation**

#### **❖ Infrastructure and Improvement Cost required for Solid Waste Management:**

Table No. 1 represents that infrastructure and improvement cost required for MSWM in Mysore District. The overall cost was found to be ₹ 104,34,400. The highest cost incurred for SWM was towards land rent and amount stood at ₹ 43,33,000. This was followed by office building rent and furniture, computer charges and their amount stood at ₹ 24,52,000 and ₹ 16,74,000 respectively. In the year 2013-14 the highest total cost was incurred towards SWM and the amount stood at ₹ 24,75,200 and the lowest cost was incurred in the year 2008-09 and the amount is ₹ 16,13,000. From the view point of land rent, the land rent has been increased from ₹ 9,00,000 to ₹ 11,83,000 in the year 2008-09 to 2013-14. In the context of office building rent, the building rent has been increased from ₹ 3,24,000 to ₹ 4,82,000 in the year 2008-09 to

2013-14. Further the furniture and computer charges, the furniture and computer charges costs has been increased from ₹ 1,85,000 to ₹ 3,56,000 in the year 2008-09 to 2013-14. From the view point of telephone and communication costs, the telephone and communication costs has been increased from ₹ 15,000 to ₹ 32,000 in the year 2008-09 to 2013-14. In the context of administration cost has been increased from ₹ 68,000 to ₹ 96,200 in the year 2008-09 to 2013-14. From the view point of maintenance cost, the maintenance cost of plant and machinery has been increased from ₹.98,000 to ₹ 2,48,000 in the year of 2008-09 to 2013-14. In the context of annual improvement cost has been increased from ₹ 23,000 to ₹ 78,000 in the year 2008-09 to 2013-14.

**Table No. 1**  
**Infrastructure and improvement cost required for solid waste management**

SI. No.	Options	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total Cost
1.	Land Rent.	900000	980000	980000	1020000	1150000	1183000	<b>4333000</b>
2.	Office building Rent	324000	386000	390000	410000	460000	482000	<b>2452000</b>
3.	Furniture and computer charges	185000	225000	286000	298000	324000	356000	<b>1674000</b>
4.	Telephone and Communication cost	15000	18000	18000	28000	26000	32000	<b>133000</b>
5.	Administration cost	68000	82000	79000	84500	89700	96200	<b>499400</b>
6.	Maintenance cost of plant and machinery	98000	127000	136000	198000	215000	248000	<b>1022000</b>
7.	Improvement cost for MSWM	23000	49000	56000	52000	63000	78000	<b>321000</b>
<b>Total Cost</b>		<b>1613000</b>	<b>1867000</b>	<b>1932000</b>	<b>2084500</b>	<b>1869700</b>	<b>2475200</b>	<b>10434400</b>

Source: Annual Budget Report of MCC.

❖ **Primary collection and secondary collection cost incurred to MSWM:**

Table No. 2 consists of primary and secondary collection costs required in MSWM. The overall cost primary and secondary cost was found to be ₹ 265,73,300. The highest cost incurred for SWM was towards Pourakarmikas wages and amount stood at ₹ 87,48,000, this was followed by garbage segregation charges was incurred lowest cost was found to be ₹ 23,49,800. In the year 2013-14 the highest cost was incurred towards primary and secondary collection costs and the amount stood at ₹ 49,15,000 and the lowest cost was incurred in the year 2009-10 and the amount is ₹ 39,40,200. From the view point of Pourakarmikas wages, the Pourakarmikas

wages cost has been remains constant from 2008-09 to 2013-14 amount stood at ₹ 14,85,000. In the context of garbage collection charges cost has been increased from ₹ 10,50,000 to ₹ 13,58,000 in the year 2008-09 to 2013-14. Further street sweeping charges, the street sweeping charges has been increased from ₹ 680000 to ₹ 946000 in the year 2008-09 to 2013-14. From the view point of garbage segregation charges, the garbage segregation charge cost has been decreased from ₹ 4,68,000 to ₹ 3,60,00 in the year 2008-09 to 2013-14. In the context of garbage monitoring charges has been increased from ₹ 5,62,000 to ₹ 7,93,000 in the 2008-09 to 2013-14.

**Table No. 2  
Primary and Secondary Collection Cost**

Year	Primary Collection Cost			Secondary Collection cost		Total Cost
	Pourakar-mikas wages	Garbage collection charges	Street sweeping charges	Garbage segregation charges	Garbage monitoring charges	
2008-09	1458000	1050000	680000	468000	562000	<b>4218000</b>
2009-10	1458000	980000	760000	414000	328200	<b>3940200</b>
2010-11	1458000	1138000	840000	462000	422000	<b>4320000</b>
2011-12	1458000	1186000	860000	326000	686300	<b>4516300</b>
2012-13	1458000	1263000	900000	319800	723000	<b>4663800</b>
2013-14	1458000	1358000	946000	360000	793000	<b>4915000</b>
<b>Total cost</b>	<b>8748000</b>	<b>6975000</b>	<b>4986000</b>	<b>2349800</b>	<b>3554500</b>	<b>26573300</b>

Sources: Tender Report of MSWM.

❖ **Transportation cost incurred for MSWM:**

Table No. 3 shows that transportation cost required for managing municipal solid waste management. The overall transportation cost was found to be ₹141,83,900. The highest total cost incurred for SWM was towards fuel or petrol cost and amount stood at ₹ 91,57,600, this was followed by maintenances cost was incurred lowest was found to be ₹ 3,98,000. In the year 2013-14 the highest cost was incurred towards transportation costs and the amount stood at ₹ 26,60,900 and the lowest cost was incurred in the year 2008-09 and the amount is ₹ 20,54,000. From the view point of operation cost, the operation cost has been decreased from ₹ 5,86,000 to ₹ 3,69,800 in the year 2008-09 to 2013-2014. In the context of maintenance cost has been increased from ₹ 56,000 to ₹ 82,000 in the year 2008-09 to 2013-14. Further the cost related to fuel has been increased from ₹ 12,36,000 to ₹ 18,25,600 in the year 2008-09 to 2013-14. From

the view point of insurance cost of the vehicle, the insurance cost has been increased from ₹ 1,76,000 to ₹ 3,83,500 in the year 2008-09 to 2013-14.

**Table No. 3**  
**Transportation cost incurred for MSWM**

SI. No.	Particulars	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total Cost
1.	Operation cost	586000	484000	630000	530000	398000	369800	<b>2997800</b>
2.	Maintenance cost	56000	48000	78000	71000	63000	82000	<b>398000</b>
3.	Fuel cost	1236000	1583000	1432000	1385000	1696000	1825600	<b>9157600</b>
4.	Insurance cost	176000	224000	238000	263000	346000	383500	<b>1630500</b>
<b>Total cost</b>		<b>2054000</b>	<b>2339000</b>	<b>2378000</b>	<b>2249000</b>	<b>2503000</b>	<b>2660900</b>	<b>14183900</b>

Sources: Transportation department of MCC

❖ **Recycling and disposal cost required for MSWM:**

**Table No.4** depicts that recycling and disposal cost should be incurred for MSWM. The overall recycling and disposal cost was found to be ₹ 153,99,929. The highest cost incurred for SWM was towards machinery maintenance cost and amount stood at ₹ 54,26,000, this was followed by compost produced cost was incurred lowest cost was found to be ₹ 35,929. In the year 2013-14 the highest cost was incurred towards recycling and disposal cost and the amount stood at ₹ 48,95,360 and the lowest cost was incurred in the year 2008-09 and the amount is ₹ 30,29,740. From the view point of man power cost, the man power cost has been increased from ₹ 3,00,000 to ₹ 5,60,000 in the year 2008-09 to 2013-14. In the context of fuel cost has been increased from ₹ 7,00,000 to ₹ 8,78,000 in the year 2008-09 to 2013-14. From the view point of consumable cost, the consumable cost has been remains constant from 2008-09 to 2013-14 amount stood at ₹ 1, 00, 000. Further the machinery maintenance cost has been increased from ₹ 8,00,000 to ₹ 10,00,000 in the year 2008-09 to 2013-14. From the view point of composite produced cost, the compost produced cost has been increased from ₹ 4,740 to ₹ 8,360 in the year 2008-09 to 2013-14. In the context of environmental monitoring cost was remains constant from

2008-09 to 2013-14 amount stood at ₹ 1,50,000. From the view point of land filling management cost, the land filling management cost has been increased from ₹ 1,75,000 to ₹ 2,15,000 in the year 2008-09 to 2013-14.

**Table No. 4**  
**Recycling and Disposal Cost required for MSWM**

Sl. No.	Particulars	2009	2010	2011	2012	2013	2014	Total Cost
1.	Man power cost	300000	350000	380000	400000	450000	560000	<b>2440000</b>
2.	Fuel cost	700000	780000	830000	835000	861000	878000	<b>4884000</b>
3.	Consumables cost	100000	100000	100000	100000	100000	100000	<b>600000</b>
4.	Machinery maintenance cost	800000	850000	900000	920000	956000	1000000	<b>5426000</b>
5.	Compost produced incurred cost	4740	4194	6933	5628	6074	8360	<b>35929</b>
6.	Environmental Monitoring cost	150000	150000	150000	150000	150000	150000	<b>900000</b>
7.	Land filling management cost	175000	180000	189000	163000	192000	215000	<b>1114000</b>
<b>Total cost</b>		<b>3029740</b>	<b>3634194</b>	<b>3975933</b>	<b>4221628</b>	<b>4402074</b>	<b>4895360</b>	<b>15399929</b>

Sources: Tender Report of MSWM.

### Findings of the Study:

The following are the major findings of the study:

- According to the annual budget report of MCC, the overall infrastructure and improvement cost was found to be ₹104,34,400.
- The highest cost was incurred towards land rent and amount stood at ₹ 43,33,000, this was followed by office building rent and furniture, computer charges and their amount stood at ₹ 24,52,000 and ₹ 16,74,000 respectively.

- In the year 2013-14 the highest total cost was incurred towards SWM and the amount stood at ₹ 24,75,200 and the lowest cost was incurred in the year 2008-09 and the amount is ₹ 16,13,000.
- The overall cost primary and secondary cost was found to be ₹265,73,300.The highest cost incurred for SWM was towards Pourakarmikas wages and amount stood at ₹ 87,48,000, this was followed by garbage segregation charges was incurred lowest cost was found to be ₹ 23,49,800.
- In the year 2013-14 the highest cost was incurred towards primary and secondary collection costs and the amount stood at ₹ 49,15,000 and the lowest cost was incurred in the year 2009-10 and the amount is ₹ 39,40,200.
- The overall transportation cost was found to be ₹ 141,83,900.The highest total cost incurred for SWM was towards fuel or petrol cost and amount stood at ₹ 91,57,600,this was followed by maintenances cost was incurred lowest was found to be ₹ 3,98,000.
- In the year 2013-14 the highest cost was incurred towards transportation costs and the amount stood at ₹ 26,60,900 and the lowest cost was incurred in the year 2008-09 and the amount is ₹ 20,54,000.
- The overall recycling and disposal cost was found to be ₹ 153,99,929.The highest cost incurred for SWM was towards machinery maintenance cost and amount stood at ₹ 54,26,000,this was followed by compost produced cost was incurred lowest cost was found to be ₹ 35,929.
- In the year 2013-14 the highest cost was incurred towards recycling and disposal cost and the amount stood at ₹ 48,95,360 and the lowest cost was incurred in the year 2008-09 and the amount is ₹ 30,29,740.

### **Suggestions for the Study:**

**The following are the major suggestions for the study:**

- ❖ The estimation of sufficient annual budget for municipal solid waste management, the MCC has to sanction for funds as much as possible, to solve hindrance of shortage of funds utilized for solid waste management process.

- ❖ It take proper step to cost allocation between programs. Some participants found it difficult to allocate costs between solid waste services. For example, it may be difficult to divide costs of individuals or equipment that are shared between programs.
- ❖ Distribution of costs over time. Most local governments were able to annualize their large capital expenditures as this information was generally available through the local finance office. However, other local governments have to take initiative performing necessary expenses in municipal solid waste management.
- ❖ The MCC has improved Level of service, maintain cleanness, community interest, political support, and many other factors make each community's program unique. to create awareness of environment programmes as well solid waste management.
- ❖ The cost effectiveness and efficiency are relative terms that are affected not only by tangible characteristics such as a community's population, economic base, etc., but also by intangible characteristics such as its solid waste management priorities and goals.
- ❖ This study suggests that finally dynamic aspect of MSWM it is challenge to the government as well as society. So it is very needed of economical support to to meet all the process of solid waste management.

## **Conclusion:**

The solid waste management in Mysore city appears to be inadequate and needs up gradation. Solid waste management across multiple Mysore city corporation, and the number of studies presently however, three tangible conclusions can be drawn from this study a full cost analysis, local governments gain a better understanding of their solid waste management costs. A thorough knowledge of its budget helps a local government make better decisions regarding its solid waste management programs and improve program efficiencies overtime, and full cost analysis. It is commonly cited that recycling costs more than disposal. This study demonstrates that such a generalization is a myth. Mysore City Corporation and the support of public private partnership create and support infrastructure for environmentally sustainable and development of through full cost analysis and cost effective is very much needed to handle overall process of solid waste management such as collection & transportation system, recycling, processing & scientific disposal etc.

## References:

- Ankur Garg., Varun Kumar and Vaibhav Verma(2007).“Public Private Partnership for Solid Waste Management in Delhi: A Case Study”, *Proceedings of the International Conference on Sustainable Solid Waste Management*, Chennai, India. pp. 552-559.
- Bovea, M.D., V.Ibanez-Fores, Gallardo and F.J. Colomer-Mendoza., (2010). ”Environmental assessment of alternative municipal solid waste management strategies: *A Spanish case study*. *Waste Manage*, 2010, 30(11): 2383-2395.
- Chang, N. B., G. Parvathinathan and J.B. Breedem.,(2008). “Combining GIS with Fuzzy Multi-criteria Decision-making for Landfill sitting in a fast-growing urban region” *Journal of Environmental Management*, 2008, 87, 139-153.
- Esakku, S., Swaminathan, A., Karthikeyan, O.P., Kurian, J., and K. Palanivelu.,(2007). “Municipal Solid Waste Management in Chennai City, India. Eleventh International Waste Management and Landfill Symposium”,Cagliari, Italy; *Environmental Sanitary Engineering Centre, Italy*,2007.
- Germà Bel., and Xavier Fageda., (2009). “Empirical analysis of solid management waste costs: some evidence from Galicia, Spain”, *Research Institute of Applied Economics*, 2009, Working Papers 2009/07, 22 pages.
- H.T. Basavarajappa, Tazdari Parviz, M.C. Manjunatha, and A. Balasubramanian., (2014). “Integration of geology, drainage and lineament on suitable landfill sites selection and environmental appraisal around Mysore city, Karnataka, India through remote sensing and GIS”, *Journal of Geomatics* , 1 April, Vol 8 No.
- James B. Hunt Jr., Jonathan B. Howes., and Gary E. Hunt., (1997). “Analysis of the Full Costs of Solid Waste Management for North Carolina Local Governments”, DPPEA, February 1997.
- Manohara B., and Belagali S.L., (2014). “Characterization of Essential Nutrients and Heavy Metals during Municipal Solid Waste Composting”, *International Journal of Innovative Research in Science, Engineering and Technology*, February 2014 ISSN: 2319-8753, Vol. 3, Issue 2.
- Rahman, M. M., K.R. Sultana and M.A. Hoque., (2008). “Suitable sites for urban solid waste disposal using GIS approach in Khulna city, Bangladesh”. 2008., 45(1), Pp: 11-22.
- Renjini RL and Prakasam V.R., (2005). “An evaluation of Municipal solid waste management in Tripunithura Municipality of Kerala “,*IJEP*, 2005, volume 25 (7) :652-656.
- Sani, Y., I. Christopher, W. Shittu and E. Jibril., (2010). “Land fill site selection for municipal solid waste management using geographic information system and multicriteria evaluation” *American Journal of Scientific Research*, 2010, Pp: 34-49.

- Sudhakar Yedla., and Sarika Kansal., (2003). “Economic insight into municipal solid waste management in Mumbai: a critical analysis”, *Int. J. Environment and Pollution*, , 2003,Vol. 19, No.5.
- Tambekar D.H. and Kale S.A., (2005). “A study on physicochemical characteristics of Municipal solid waste of Amravati city, Maharashtra,” *Nature Environmental. And Pollution Tech*, 2005, Vol. 4, No. 3:459 – 462.
- Yadav Ishwar Chandra., and N. Linthoingambi, Devi., (2009). “Studies on Municipal Solid Waste Management in Mysore City- A Case Study”, *Report and Opinion*, Volume No. 3.