



# **Chapter - IV**

## **Chapter – 4**

### **FINANCIAL IMPLICATIONS OF SOLID WASTE MANAGEMENT FOR BELGAUM MUNICIPAL CORPORATION**

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## **Chapter – 4**

# **FINANCIAL IMPLICATIONS OF SOLID WASTE MANAGEMENT FOR BELGAUM MUNICIPAL CORPORATION**

### **4.1 Introduction**

While studying the financial implications of solid waste management for Belgaum city means not the costs, but to markets, price system and essentially the consumer producer behaviour solid waste are consumption and production residuals which are derived primarily by economic variables particularly by prices and incomes variables. Although population size and concentration are also important factors. It follows then that of solid waste management is an important economic problem.<sup>1</sup>

### **Analysis of Expenditure (Cost) Incurred on Solid Waste Management by Belgaum Municipal Corporation**

There is no separate solid waste management department with Belgaum Municipal Corporation. The task by solid waste management comes under the health and sanitation department of Belgaum Municipal Corporation. The conservancy wing looks after the solid waste management. The transport wing provides vehicles only. It is supervised by engineering section of Belgaum Municipal Corporation. This section looks not only after conservancy transport vehicles, but also the types of vehicles. The Belgaum Municipal

Corporation is incurring expenditure on storage of solid waste, wages and allowances of employees, cleaning materials, vehicles maintenance, vehicle depreciation and office expenditure etc. The expenditure incurred by government at any level is called public expenditure likewise; expenditure incurred by Belgaum Municipal Corporation is the public expenditure of the corporation.

Perhaps most important of all harmonious development of all harmonious development of industry demand good communication. It is not enough for the country to have abundant and varied wealth, enormous distance often hinders attempts at economic development.<sup>2</sup>

#### **4.2 Overall Budgetary Position of Belgaum Municipal Corporation**

The local governments have been playing a vital role at local levels in improving the living conditions and standards of the people. So that people gave much more importance to local governments. Likewise, Belgaum Municipal Corporation being an urban local government has been playing an important role directed towards improving conditions and standards of living of its citizens, by providing various public goods or services to them. The overall budgetary position of Belgaum Municipal Corporation have been increased because of increase in total revenue and which resulted into increase in expenditure.

In other words, the budget of Belgaum Municipal Corporation has been increasing due to increase in its functions and scope.

Discussion of the local government are often made in terms of the high ideas of our civilisation, liberty, equality, fraternity, pluralism, social justice and democratic participation. In Anglo-American practice, the municipal corporation is a primary unit of local government. However, there were corporations and established by and for businessmen and such become the model of the local government in the bourgeaire age.<sup>3</sup>

Table No. 4.1 provides the data about overall budgetary position of Belgaum Municipal Corporation.

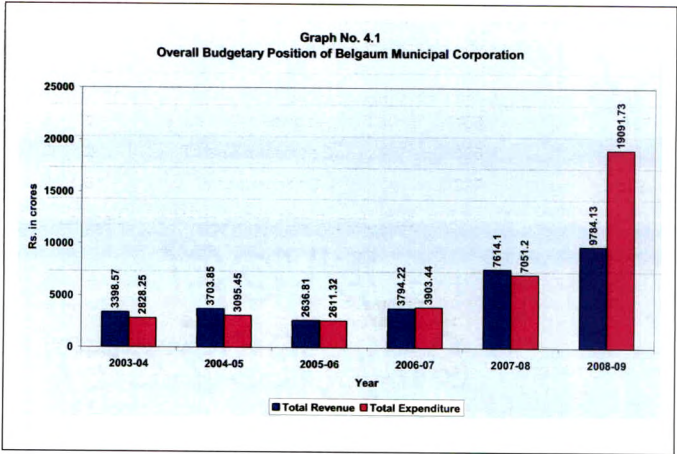
**Table No. 4.1**  
**Overall Budgetary Position of Belgaum Municipal Corporation**  
(Rs. in crores)

Year	Total Revenue	Total Expenditure	Surplus (+) Deficit (-)
2003-04	3398.57 (15.19)	2828.25 (17.91)	516.32
2004-05	3703.85 (16.42)	3095.45 (19.65)	608.40
2005-06	2636.81 (0.96)	2611.32 (0.97)	25.49
2006-07	3794.22 (2.87)	3903.44 (2.79)	-109.22
2007-08	7614.10 (7.39)	7051.20 (7.98)	562.90
2008-09	9784.13 (95.12)	19091.73 (48.75)	-9307.60
CGR	25.01	42.21	-

Source : Annual Budgetary Reports of Belgaum Municipal Corporation

Note : 1) CGR – Compound Growth Rate

2) Figures in brackets indicate percentages of surplus/deficit to Total Revenue Expenditure.



The table No. 4.1 gives the data regarding the Total Revenue and Total Expenditure of Belgaum Municipal Corporation during the period 2003-04 to 2008-09.

It is observed that during the period under the study, the Belgaum Municipal Corporation has succeeded in controlling its budgetary deficit.

It has not succeeded in promoting growth of Total Revenue (CGR 25.01) than Total Expenditure (CGR 42.21). So that expenditure growth rate was more than Total Revenue.

The processing of data by employing standard deviation reveals that Total Revenue (Std. dev. 2858.66 crores) had less variations they in Total Expenditure (Std. dev. 6408.99 crores) of Belgaum Municipal Corporation. The mean of Total Revenue was Rs. 5155.28 crores and

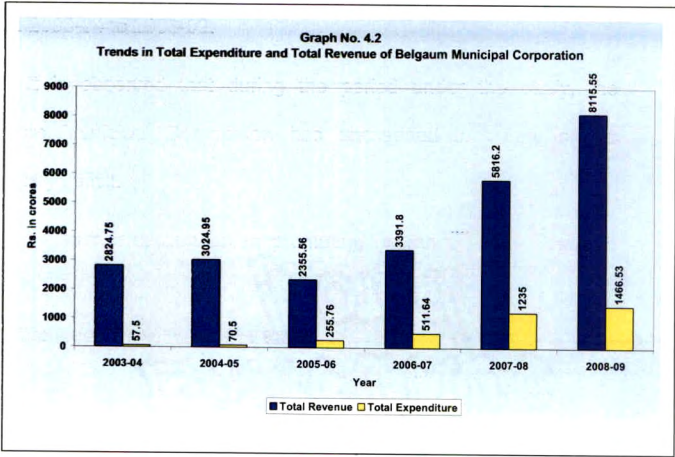
the mean of Total Expenditure was Rs. 6439.23 crores. So there was average increase in Total Expenditure, which was more than Total Revenue. A techniques of correlation shows that Total Expenditure was positively and significantly correlated at .920 to Total Revenue.

The foregoing analysis reveals that the Belgaum Municipal Corporation has undertakes good fiscal practices on the ground of its surplus or deficit of overall account. Because, it has controlled deficit except two years, which is not permitted. Its public expenditure grew rapidly than the public revenue, but size of Total Revenue was always greater than Total Expenditure. The growth in both the Total Revenue as well as Total Expenditure was rapid and significant, but total Expenditure grew more rapidly. It is good that surplus was significant. Only important thing for us is to meet extent this corporation has undertakes solid waste management activities and succeeded in it. The Belgaum Municipal Corporation is playing important role in social and economic development of the Belgaum economy. The composition of Total Expenditure divides it into Revenue Expenditure and Capital Expenditure that shows role of Belgaum Municipal Corporation directed towards development of the city. The Table No. 4.2 represents the necessary data about that.

**Table No. 4.2**  
**Overall Budgetary Position of Belgaum Municipal Corporation**

Year	Total Revenue	Total Expenditure	Surplus (+) Deficit (-)
2003-04	2824.75 (98%)	57.50 (2%)	2882.25 (100%)
2004-05	3024.95 (97%)	70.50 (3%)	3095.45 (100%)
2005-06	2355.56 (90%)	255.76 (10%)	2611.32 (100%)
2006-07	3391.80 (86%)	511.64 (14%)	3903.44 (100%)
2007-08	5816.20 (82%)	1235.00 (18%)	7051.20 (100%)
2008-09	8115.55 (85%)	1466.53 (15%)	9282.08 (100%)
CGR	(24.26%)	(10.07%)	(28.87%)

Source : Annual Budgetary Reports of Belgaum Municipal Corporation  
Note : Figures into brackets indicate percentages to the Total Expenditure.





The economic classification of Revenue Expenditure indicates that, money spent on items, when the benefits lasts for less than a year. Expenditure which does not result in the creation of assets is the Revenue Expenditure.

The Table No. 4.2 indicates that Revenue Expenditure of Belgaum Municipal Corporation was more than Capital Expenditure. The rate of growth of Revenue Expenditure was 24.26% per annum during 2003-04 to 2008-09. But Capital Expenditure shows that growth rate was 10.07% per annum during the same period. The techniques of standard deviation shows that Revenue Expenditures standard deviation was Rs. 2247.37 crores and Capital Expenditures standard deviation was Rs. 609.09 crores. So we find greater variations in Revenue Expenditure of Belgaum Municipal Corporation. The techniques of correlation indicates that the correlation between Total Expenditure and Total Revenue Expenditure was .998 and with Capital Expenditure it was .968. The techniques of regression reveals that standard beta value of Capital Expenditure was of by .222. So in future years also the Revenue Expenditure will be more than Capital Expenditure.

A technique of standard deviation reveals that Total Expenditure of the Belgaum Municipal Corporation had greater variations during the period under study, which was followed by Revenue Expenditure. Revenue as well as Capital Expenditure were highly and positively correlated with Total Expenditure was a prominent determinant

of Total Expenditure of the Belgaum Municipal Corporation than the Capital Expenditure.

It is revealed that expenditure pattern of the Belgaum Municipal Corporation was irrational, because it did not assign due weightage to Capital Expenditure necessary for long term development and civic amenities to the citizens. This corporation has concentrated of providing civic amenities to its people at presently by incurring a huge expenditure and a lion's share of Total Expenditure of Revenue Expenditure. Likewise, its Revenue Expenditure grow more rapidly than its Capital Expenditure. It is also observed that Capital Expenditure of the corporation has been growing slowly compared with a meagre share of Capital Expenditure in its Total Expenditure. This analysis indicates urgent and adequate need to be paid towards Capital Expenditure essential for long term development and providing of civic amenities for the citizens.

The municipal authorities were largely responsible for creating modern cities. They laid the roads and streets, brought in clean water, drained the land disposed of sewage and waste installed parks and pavements, made a room for railways and provide electricity and telecommunications.<sup>4</sup>

In India, local government is widely known as local self government. The term local self government and local government are synonymous. In general, local self government may be said to involve the conception of territorial, non-sovereign community. The term

originated when the country was under the British rule. In the Indian Constitution<sup>5</sup> local government that is to say, that the constitution and powers of municipal corporation. Improvements trusts, district boards and other local authorities for the purpose of the local government.

#### **4.3 Growth and Composition of Revenue Expenditure of Belgaum Municipal Corporation**

Revenue Expenditure is the amount spent on items, whose benefits lasts for less than a year. The Belgaum Municipal Corporation till 2003-04 to 2004-05, the Revenue Expenditure was very brief. It was not classified as it is now. So we get the expenditure pattern with a few major heads.

After 2005-06, the Belgaum Municipal Corporation has provided the detailed expenditure pattern of revenue side. The classification of Revenue Expenditure into 8 heads such as –

- a) General Administration
- b) Lightings
- c) Public Health
- d) IT Cells
- e) Works under Master Plans
- f) Accounts and Finance
- g) Solid Waste Management
- h) Miscellaneous Expenditure

Table No. 4.3 shows the Revenue Expenditure of Belgaum Municipal Corporation

**Table No. 4.3**  
**Revenue Expenditure of Belgaum Municipal Corporation**

(Rs. In crores)

Year	General Administration	Lighting	Public Health	IT Cells	Master Plan	Accounts & Finance	Solid Waste Management	Miscellaneous	Total Revenue Expenditure
2003-04	61.00 (0.21%)	420.80 (14%)	1988.85 (70%)	0.00 (0%)	288.0 (10%)	0.00 (0%)	0.00 (0%)	61.10 (2.34%)	2824.75 (100%)
2004-05	7790 (2.57%)	476.35 (15.74%)	2210.75 (73%)	0.00 (0%)	212.25 (7%)	0.00 (0%)	0.00 (0%)	47.70 (15%)	3024.95 (100%)
2005-06	469.20 (20%)	92.05 (4.28%)	1257.85 (53.39%)	43.32 (1.8%)	123.73 (5.2%)	26.60 (1.1%)	275.76 (12%)	67.06 (2.8%)	2355.56 (100%)
2006-07	665.95 (19.20%)	431.00 (12.70%)	1658.51 (49%)	67.50 (1.9%)	131.50 (3.8%)	30.50 (0.8%)	320.20 (9.41%)	86.64 (2.5%)	3391.80 (100%)
2007-08	583.00 (10%)	775.70 (13.3%)	3209.55 (55%)	180.05 (3%)	182.55 (3.1%)	52.85 (0.96%)	546.75 (9.4%)	285.75 (0.04%)	5816.20 (100%)
2008-09	863.90 (11%)	1953.30 (24%)	2080.70 (26%)	45.90 (0.56%)	1128.05 (14%)	7.60 (0.74%)	917.00 (11.28%)	575.77 (70%)	8115.55 (100%)
CGR	75.41	35.69	4.73	12.23	20.17	35.25	51.28	61.80	24.26

Source : Same as of Table No. 4.1 & 4.2

Note : 1) Figures into brackets indicate percentages to Total Revenue Expenditure.

2) CGR = Compound Growth Rate

The Table No. 4.3 reveals that different types of expenditures done on the revenue side by the Belgaum Municipal Corporation. The compound growth rate was 24.26% per annum for Total Revenue Expenditure. The highest growth of Revenue Expenditure item was on general administration, it was 74.90% per annum.

The Revenue Expenditure on solid waste management was just 0.18% per annum. It means that Belgaum Municipal Corporation has completely neglected the solid waste management of the city. So there is need to spent some more amount on the solid waste management of city.

The technique of standard deviation reveals that it was Rs. 2247.34 crores for Total Revenue Expenditure and standard deviation of solid waste management was Rs. 349.66 crores. The greater variations were found in other items of Revenue side than the solid waste management item. The technique of correlation indicated that there was positive correlation between solid waste management and Revenue Expenditure. Between solid waste management and Revenue Expenditure was .915. The techniques of regression reveals that corporation has more emphasis on general administration with beta value .401.

The processing of data revealed that expenditure on street lights, public health, IT cells had greater variations than other items of Revenue Expenditure during the period under study. All items of Revenue Expenditure had positive and high degree association with

Total Expenditure except public health and IT cells during the period into consideration. According to regression, miscellaneous items, general administration, public health greatly affected Total Revenue Expenditure of the Belgaum Municipal Corporation during the period under study.

The foregoing analysis reveals that even though it was necessary to pay the attention towards solid waste management as an emigrated activity that was not paid by the Belgaum Municipal Corporation during the period under study. The corporation has given emphasis on providing public health facilities, which are also important from the point of view of emigrant protection as well promoting of social welfare, which was followed by street lighting. It is true that the corporation has given unnecessary importance to administration. But except solid waste management activities, the Belgaum Municipal Corporation's Revenue Expenditure pattern is good on social welfare ground. That it is urgent need of the hour to pay due attention towards solid waste management, which is important for protecting of the environment as well as a source of earnings.

W. A. Robins writes, 'Local government may be said to involve the conception of a territorial, non-sovereign community possessing, the legal right and necessary organisation to regulate its own affairs. This in term pre-suppose the existence of a social authority with the power to act independently on external control as well as participation of the local community in the administration of its own affairs.'<sup>6</sup>

It should be noted that provision of the funds alone is not going to help to solve the problem of urban government. They must utilize there funds properly and for that trained and competent staff is necessary, but what is equally important is sound budgeting. Similarly, a good system of continuous internal and regular external audit must be immediately introduced.<sup>7</sup> It is obvious that the growth in urban population and urban areas generates more and more solid wastes. Indian cities produce wastes in the aggregate 1,00,000 – 1,10,000 metric tonnes or per capita average of 0.40 – 0.42 kg a day.<sup>8</sup>

#### **4.4 Growth and Composition of Capital Expenditure of Belgaum Municipal Corporation**

The Capital Expenditure is more important for the future and long term development of the city. So all the local bodies should spend a major share of Total Expenditure on Capital Expenditure. It is good spending policy for development. So it becomes necessary to study the Capital Expenditure pattern of the Belgaum Municipal Corporation.

The items included in Capital Expenditure are –

1. General Administration
2. IT Cell
3. Public Works
4. Health and Welfare
5. Solid Waste Management

Table No. 4.4 shows the growth and composition of Capital Expenditure of the Belgaum Municipal Corporation.

**Table No. 4.4**  
**Growth and Composition of Capital Expenditure of Belgaum Municipal Corporation**

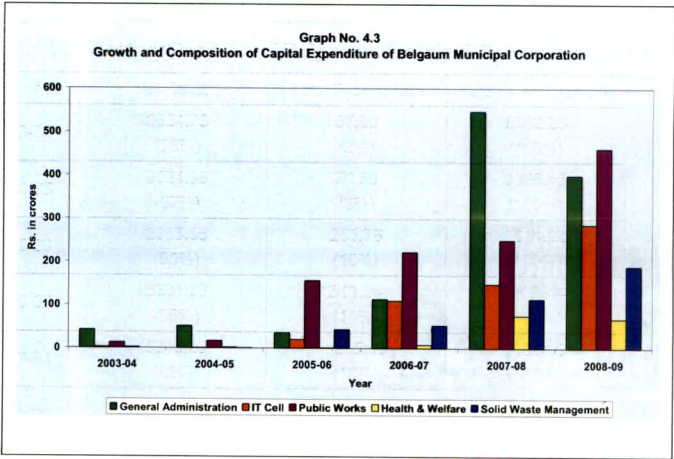
Year	General Administration	IT Cell	Public Works	Health & Welfare	Solid Waste Management	Total Capital Expenditure
2003-04	41.50 (73%)	2.00 (3.4%)	12.50 (21.73%)	2.00 (3.4%)	0.00 (0%)	57.50 (100%)
2004-05	51.00 (71%)	0.50 (0.70%)	16.50 (23%)	2.00 (2.8%)	0.50 (0.70%)	70.50 (100%)
2005-06	35.51 (13.8%)	19.65 (7.6%)	156.40 (61%)	0.99 (0.38%)	43.21 (16.8%)	255.76 (100%)
2006-07	113.60 (22%)	110.00 (21.50%)	222.00 (43%)	8.04 (1.57%)	53.00 (10.35%)	511.61 (100%)
2007-08	548.00 (44.37%)	148.00 (11.98%)	250.00 (20%)	75.00 (6%)	114.00 (115.38%)	1235.00 (100%)
2008-09	400.00 (27%)	286.00 (19.50%)	462.00 (31.50%)	68.53 (4.67%)	190.00 (12.95%)	1466.53 (100%)
CGR	75.14	247.16	113.54	139.97	261.48	107.07

Source : Same as of Table No. 4.1

Note : 1) Figures in brackets indicate percentage to Total Capital Expenditure

2) CGR = Compound Growth Rate





It is found from Table No. 4.4 that Total Capital Expenditure of Belgaum Municipal Corporation has given importance to general administration in 2003-04 but gradually its importance was reduced initially in the year 2003-04 on Capital Expenditure was done on solid waste management. The public works item also got its importance in 2007-08. The Belgaum Municipal Corporation is also emphasis on other items of Capital Expenditure for the welfare of Belgaum citizens.

When we use different statistical techniques, it reveals that maximum expenditure was done on the general administration i. e. Rs. 548.00 crores and minimum expenditure was done on solid waste management. The techniques of standard deviation reveals that the variation in Capital Expenditure on general administration was

more (Rs. 220.42 crores) and standard deviation of solid waste management was least i. e. Rs. 73.48 crores. The correlation analysis reveals that a positive and high degree of correlation between general administration and Total Capital Expenditure a techniques of regression analysis adequately proves that general administration was an important determinant (std. beta .475).

The study of Capital Expenditure of Belgaum Municipal Corporation reveals that it has given a significant priority to general administration than the other items. But now there is change in the trend of Capital Expenditure. In 2007-08 Belgaum Municipal Corporation was emphasising on public health items of Capital Expenditure. This indicates that there was increase in welfare and development activities of Belgaum Municipal Corporation.

The processing of data showed that the Belgaum Municipal Corporation spent higher on public works and general administration on an average from its Total Capital Expenditure. According to correlation all items of Capital Expenditure had positive and high degree association with Total Capital Expenditure of the Belgaum Municipal Corporation. Regression analysis states, public works, general administration had greater influence on Total Capital Expenditure of the corporation during the period under study.

The foregoing analysis reveals that the Belgaum Municipal Corporation's Capital Expenditure pattern has several striking features. But the important feature is that the corporation has neglected solid

waste management activity compared to all others. It was observed that public works, health and welfare, and general administration were the major items of Capital Expenditure of the Belgaum Municipal Corporation. It is fact that public works, health and welfare also play an important role in social welfare promoting of the society. But it was also necessary to pay due attention towards solid waste management on various grounds. The Belgaum Municipal Corporation has concentrated on efficient administration during the period of the study.

#### **4.5 Growth and Composition of Total Expenditure on Solid Waste Management by Belgaum Municipal Corporation**

Belgaum city's most popular project of recycling of solid waste at last started in Turumuri village. Hyderabad's Ramco Enviro Company got the contract for this project. From the year 2003-04 Turumuri village was a place for dumping the solid waste. But from 7-1-2008 the collected solid waste is being used for producing organic manure.

The recycling of organic matter by decaying organisms produces humus, the controlled and accelerated bio-degradation of moist organic matter to a humus like products can be used as fertilizer or soil conditioner is known as "Composting."<sup>9</sup>

In view of the serious environmental degradation resulting from unscientific disposal of municipal solid waste, the Ministry of Environment and Forests (Government of India) has notified the municipal solid wastes (Management & Handling) rules, 2000 (MSW

Rules) compliance criteria for each and every stage of waste management collection, segregation at source, transportation, processing and final disposal are set out in the MSW rules.<sup>10</sup>

The Table No. 4.5 shows that growth and composition of solid waste management by Belgaum Municipal Corporation. The amount of expenditure done by Belgaum Municipal Corporation is shown in the table.

**Table No. 4.5**  
**Growth and Composition of Total Expenditure on Solid Waste Management**

Year	Total Expenditure	Revenue Expenditure	Capital Expenditure	Total Expenditure on SWM
2003-04	2882.25 (100%)	0.00	1.50	1.50 (0.50%)
2004-05	3095.45 (100%)	0.00	1.00	1.00 (0.032%)
2005-06	2611.32 (100%)	204.78	0.00	204.78 (7.84%)
2006-07	3903.44 (100%)	241.20	0.00	241.20 (6.17%)
2007-08	7051.20 (100%)	470.75	61.00	531.75 (7.54%)
2008-09	19091.73 (100%)	811.55	1466.53	9582.08 (50.18%)
CGR	42.21	222.44	1090.12	501.57

Source : Annual Budgetary Reports of

Note : 1) CGR = Compound Growth Rate

2) Figures in brackets indicate that percentage of Total Expenditure on solid waste management to Total Expenditure.

The Table No. 4.5 shows the expenditure done on the solid waste management. When we see the percentage of expenditure in the year 2003-04, expenditure done on solid waste management was very meagre but there is change in trend as year passed on. In the year 2007-08 there was remarkable change in expenditure pattern of solid waste management. It increased to 50% of Total Expenditure in 2008-09. The technique of standard deviation reveals that Revenue Expenditure was Rs. 324.04 crores and Capital Expenditure was Rs. 594.00 crores. So there was much variation in Revenue Expenditure of solid waste management than Capital Expenditure of solid waste management.

The technique of correlation reveals that there is a positive and high degree relation between Total Expenditure of solid waste management (.977) and Total Expenditure. Thus, Belgaum Municipal Corporation has to spend money on Capital Expenditure of solid waste management. So that collected waste can be properly used for future process. Thus, Belgaum Municipal Corporation can earn more income from solid waste which it collects. So there is need to increase the expenditure of solid waste management on capital side.

The processed data revealed that Revenue Expenditure on solid waste management had greater variations than Capital Expenditure on solid waste management during the period under study. According to correlation analysis, all the items namely Total Expenditure on solid waste management, Revenue Expenditure on solid waste

management, Capital Expenditure on solid waste management had positive and high degree correlation with Total Expenditure of the Belgaum Municipal Corporation. According to regression, Revenue Expenditure was a determinant of Total Expenditure on solid waste management.

It is clear that the Belgaum Municipal Corporation has initially neglected the activity of solid waste management. But lastly, it has paid due attention.

“The overall goal of this survey was to assess the present situation of Sidney village (Shaxi Commune, Janchuan Country, People’s Republic of China) in the field of environmental sanitation, which comprises water supply, excreta and waste water management. Solid waste management and storm water drainage, goal of the survey was to identity the willingness of stakeholders on different levels to introduce a decentralised sanitation system.”<sup>11</sup>

The collection, transportation and disposal of the waste of MSW represents a large expenditure for third world cities, waste management usually accounts for 30-50 percent of municipal corporation budgets. Despite there high expenses, cities collect only 50-80 percent pf the refuse generated. In India, for instance, about 50% of the refuse generated is collected, 33% in Karachi, and disposal received less attention as much as 90% of the municipal solid waste collected in Asian cities end up in open dumps.<sup>12</sup>

#### **4.6 Growth and Composition of Capital Expenditure on Solid Waste Management by Belgaum Municipal Corporation**

The estimated investment for upgrading the existing solid waste management system to the proposal system has been estimated at Rs. 211.5 crores. There is need to purchase new equipments like auto tippers, tricycles, handcart, push cart, dust bins of 40 litres. The operational costs for solid waste management for city corporation of Belgaum is presented in Table No. 4.6. The table takes the revised estimates of costs of the corporation of Belgaum from 2003-04 to 2008-09. The overall costs are expected to marginally increase. It leads to increase in quality of services significantly.

Based on data from US each person in the United States generated 4.5 pounds of solid waste per day in 2000. Throughout the country, solid waste management is a major issue. A few states have mandated upto a 50 percent reduction in waste going to land fills. Some communities are establishing mandatory recycling programmes. Waste is no longer out of sight and out of mind. Waste is now visible as part of public policy.<sup>13</sup>

**Table No. 4.6**  
**Growth and Composition of Capital Expenditure of Solid Waste Management of Belgaum Municipal Corporation**

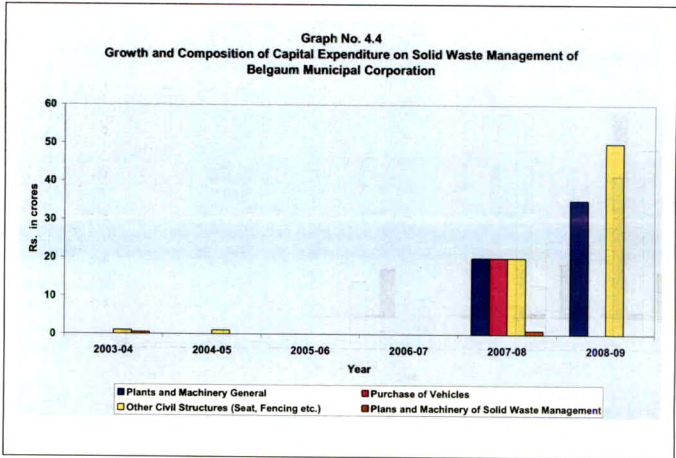
Sr. No.	Items	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	CGR
1	Plants and Machinery General	0.00	0.00	0.00	0.00	20.00 (32.78%)	35.00 41%)	75.00
2	Purchase of Vehicles	0.00	0.00	0.00	0.00	20.00 (32.78%)	0.00	-
3	Other Civil Structures (Seat, Fencing etc.)	1.00 (66.6%)	1.00 (100%)	0.00	0.00	20.00 (32.78%)	50.00 (59%)	223.36
4	Plans and Machinery of Solid Waste Management	0.50 (33.33%)	0.00	0.00	0.00	1.00 (1.6%)	0.00	100
	Total Capital Expenditure of SWM	1.50 (100%)	1.00 (100%)	0.00 (100%)	0.00 (100%)	61.00 (100%)	85.00 (100%)	279.16

Source : Same as of Table No. 4.1

Note : 1) CGR = Compound Growth Rate

2) Figures in brackets indicates the percentage of Capital Expenditure on solid waste management on Total Capital Expenditure





The Table No. 4.6 indicates that Capital Expenditure of solid waste management increased considerably from 2003-04 to 2008-09. The compound growth rate on plant and machinery of solid waste management was 100% from 2003-04 to 2008-09. The Belgaum Municipal Corporation has not sanctioned any amount on purchase of new vehicles. The other items of Capital Expenditure on solid waste management like construction of civil structures, Belgaum Municipal Corporation paid due attention. The compound growth rate of it was 223.36. From 2007-08 and 2008-09 Belgaum Municipal Corporation is paying attention towards other items of Capital Expenditure of solid waste management.

The technique of standard deviation reveals that plans and machinery's general expenses has standard deviation value of 14.9722 and standard deviation of civil structures was 20.1891. So we can say that Belgaum Municipal Corporation has paid due attention towards civil amenities. The technique of correlation reveals that there is positive correlation between all other items of Capital Expenditure and Total Capital Expenditure of solid waste management. The correlation was .466 and .959 for vehicle purchase and civil structures. The technique of regression reveals that plant and machinery expenses, purchase of vehicles, civil structures and miscellaneous expenses of solid waste management were having unstandardized coefficient beta value of 1.00.

According to processed data general administration and other civil constructions had a high degree and positive correlation with Total Expenditure on solid waste management. Regression technique also revealed that general administration and civil constructions were determinants of Total Expenditure on solid waste management by the Belgaum Municipal Corporation. According to regression analysis, expenditure on human resources was a prominent determinant of Revenue Expenditure on solid waste management by the Belgaum Municipal Corporation.

#### **4.7 Growth and Composition of Revenue Expenditure of Solid Waste Management on Belgaum Municipal Corporation**

Revenue expenditure pattern on solid waste management includes the expenses incurred for day to day handling of solid waste.

It includes the expenditure on –

1. Human Resources Expenses like salaries of staff, wages of workers etc.
2. General Expenses
3. Repairs and Maintenance Expenses
4. Operating Expenses of Solid Waste Management Dumping
5. Other Out Sourced Expenses

In Belgaum Municipal Corporation there is Revenue Expenditure rather than Capital Expenditure per day waste collected was in huge amount, proper collection and disposal of it is the big task before Belgaum Municipal Corporation. So Belgaum Municipal Corporation has to insure more spending one revenue side other than capital side. The Table No. 4.7 reveals the expenditure on solid waste management of revenue side of Belgaum Municipal Corporation.

**Table No. 4.7**  
**Revenue Expenditure of Solid Waste management of Belgaum Municipal Corporation**

Sr. No.	Items	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	CGR
1	Human Resource Expenses	0.00	0.00	1.20 (0.58%)	1.20 (0.49%)	8.00 (1.69%)	816.00 (63%)	607.54
2	General Expenses	0.00	0.00	0.00	0.00	18.25 (3.87%)	22.85 (1.74%)	25.20
3	Repair & Maintenance Expenses	0.00	0.00	0.00	0.00	6.00 (1.27%)	20.00 (1.53%)	233.33
4	Operating Expenses of Solid Waste Dumping	0.00	0.00	11.31 (5.52%)	15.00 (6.21%)	213.50 (46%)	182.50 (13.97%)	111.61
5	Outsourced Solid Waste management Expenses	0.00	0.00	192.27 (5.52%)	225.00 (93.28%)	225.00 (48%)	467.50 (35.78%)	24.52
	Total for Solid Waste Management (Revenue Side)	0.00	0.00	204.78 (100%)	241.20 (100%)	470.75 (100%)	1306.35 (100%)	-

Source : Same as of Table No. 4.1

Note : 1) CGR = Compound Growth Rate

2) Figures in brackets indicates the percentage of all the items of Revenue side on solid waste management to Total Expenditure of Belgaum Municipal Corporation's revenue side.

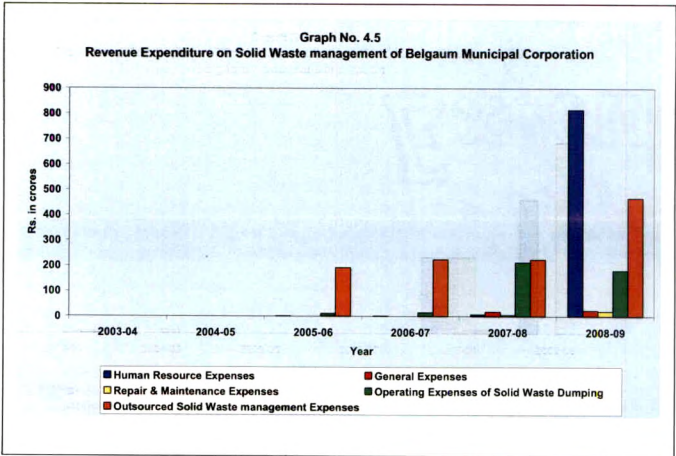


Table No. 4.7 indicates the Revenue Expenditure on solid waste management of Belgaum Municipal Corporation considerably from 2003-04 to 2008-09. In 2003-04 and 2004-05, the Revenue Expenditure on solid waste management of Belgaum Municipal Corporation was nil. But after 2005-06, it increased slowly. The compound growth rate of total solid waste management of revenue side was 65.99% it means that Belgaum Municipal Corporation has paid proper attention towards the revenue side of solid waste management. The expenses on human resource were more than any other items of revenue side. It's compound growth rate was 607.54. The technique of correlation tells the relationship between Total Revenue Expenditure and other items of solid waste management. Human resources expenses items collection with Total Revenue Expenses of solid waste management was .937 and

with general expenses it was .883. So, there is high degree of correlation with other items. The technique of regression reveals that standard beta value of human expenses was .528 and expenses of solid waste management dumping was .229. Thus, with this table we say that, human resources expenses were huge burden on revenue side. Major share was captured by it and that is need to be controlled. So Belgaum Municipal Corporation can efficiently handle the solid waste management system. The processed data revealed that all items of Revenue Expenditure of solid waste management had positive and high degree correlation during the period into consideration.

#### 4.8 Some Important Issues of Solid Waste Management in Belgaum

Table No. 4.8 indicates the Profile of Respondents.

**Table No. 4.8**  
**Profile of Respondents**

Sr. No.	Category	No. of Persons
1	Teachers	10 (20.0)
2	Corporators	05 (10.0)
3	Citizens	10 (20.0)
4	Servants	10 (20.0)
5	Students`	10 (20.0)
6	Professionals	05 (10.0)
	Total	50 (100)

Source : Field Survey, April 2009

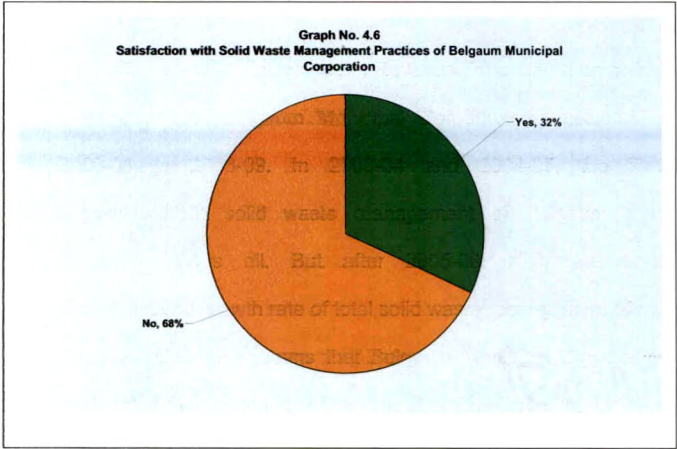
Note : Figures in parenthesis indicates percentage to the total.

In the profile of primary survey carried out, the distinction of sample, which gave representation to the important groups or society of population in the Belgaum city.

**Table No. 4.9**  
**Satisfaction with Solid Waste Management Practices of Belgaum Municipal Corporation**

Sr. No.	Response	Frequency	Percentage
1	Yes	16	32.00
2	No	34	68.00
	Total	50	100

Source : Same as of Table No. 4.8



The majority of citizens of Belgaum city are not satisfactory with the solid waste management activities of the Belgaum Municipal Corporation . this requires to pay due attention towards that.

**Table No. 4.10**  
**Drawbacks in Solid Waste Management Practices by Belgaum Municipal Corporation**

Sr. No.	Nature	Frequency	Percentage
1	Collection	08	16.0
2	Inadequate Collection	31	62.0
3	No Distinction between Solid Waste	10	20.0
4	Others	01	02.0
	Total	50	100

Source : Same as of Table No. 4.8

It is revealed that Belgaum Municipal Corporation has failed in collecting all solid waste generated in the city. Likewise, the corporation also is not prompt in the segregating of solid waste into dry and net waste.

**Table No. 4.11**  
**Money Willing to Pay for Efficient Solid Waste Management Practices in the City**

Sr. No.	Period & Amount	Frequency	Percentage
1	Rs. 1000 per month	11	22.0
2	Rs. 500 per month	01	02.0
3	Rs. 100 per month	14	28.0
4	Nil	24	48.0
	Total	50	100

Source : Same as of Table No. 4.8

About fifty percent of Belgaum citizen are willing to pay for proper management of solid waste. Attempts should be made to change with set of others. Especially those having ability to pay.



**Table No. 4.12**  
**Participation in Solid Waste Management in the City**

Sr. No.	Items	Frequency	Percentage
1	Proper Collection by BMC	30	60.0
2	Use of Own Labour Force	06	12.0
3	Use of Own Vehicles	01	02.0
4	Total Collection and Disposal of Waste	13	26.0
	Total	50	100

Source : Same as of Table No. 4.8

The data in the table reveals that the Belgaum Municipal Corporation should endeavour for the proper management of solid waste in the city.

**Table No. 4.13**  
**NGO's Participation in Solid Waste Management in the City**

Sr. No.	Items	Frequency	Percentage
1	Yes	26	52.0
2	No	22	44.0
3	Derives	02	04.0
	Total	50	100

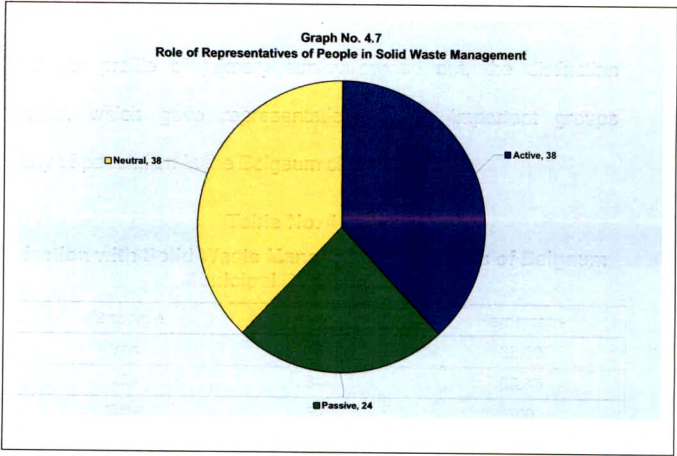
Source : Same as of Table No. 4.8

It is good thing that NGO's also participate in the activity of solid waste management in the city of Belgaum.

**Table No. 4.14**  
**Role of Representatives of People in Solid Waste Management**

Sr. No.	Nature	Frequency	Percentage
1	Active	19	38.0
2	Passive	12	24.0
3	Neutral	19	38.0
	Total	50	100

Source : Same as of Table No. 4.8



The representatives of the people in the Belgaum city are not much active in participating in the solid waste management.

Table No. 4.15  
NCC, NSS Volunteers Contributions to Solid Waste Management

Sr. No.	Nature	Frequency	Percentage
1	Yes	10	20.0
2	No	16	32.0
3	I don't know	14	28.0
4	It will be better	10	20.0
	Total	50	100

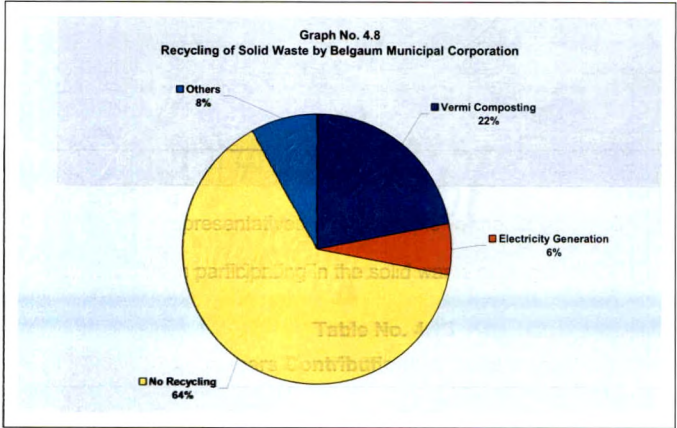
Source : Same as of Table No. 4.8

It was found that the volunteers of NCC, NSS have not participated in solid waste management to the extent expected and desirable.

Table No. 4.16  
Recycling of Solid Waste by Belgaum Municipal Corporation

Sr. No.	Types	Frequency	Percentage
1	Vermi Composting	11	22.0
2	Electricity Generation	03	06.0
3	No Recycling	32	64.0
4	Others	04	08.0
	Total	50	100

Source : Same as of Table No. 4.8



It is bad that the Belgaum Municipal Corporation did not undertake recycling of solid waste, which is beneficial on various grounds.



The picture shows the solid waste which is collected for recycling by the Belgaum Municipal Corporation

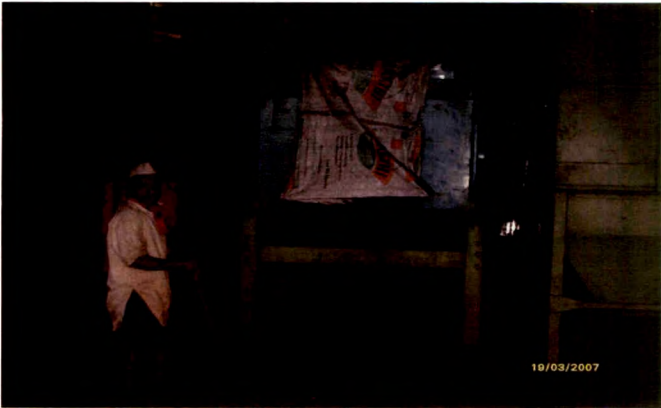


Hyderabad's Ramco Enviro Company – Belgaum City's most popular project of recycling of solid waste at Tirumuli village

**Table No. 4.17**  
**Suggestions for Recycling of Solid Waste**

Sr. No.	Types	Frequency	Percentage
1	Vermi Composting	35	70.0
2	Electricity Generation	15	30.0
	Total	50	100

Source : Same as of Table No. 4.8



**From the solid waste final production of manure is produced with this machine**



**The manure which is produced from the waste that is collected**

The majority of citizens of the Belgaum city prefer vermi composting that electricity generating. It may be because that facilitates organic farming.

**Table No. 4.18**  
**Efforts of Belgaum Municipal Corporation to Achieve Belgaum as a Clean City**

Sr. No.	Nature	Frequency	Percentage
1	Yes	23	46.0
2	No	27	54.0
	Total	50	100

Source : Same as of Table No. 4.8

It is revealed that the Belgaum Municipal Corporation is not keeping city clean and which is need of the law. More importantly it is necessary for qualitative emigrant of the city.

**Table No. 4.19**  
**Unsound Financial Position of Belgaum Municipal Corporation is Responsible for Inadequate Management**

Sr. No.	Nature	Frequency	Percentage
1	Yes	21	42.0
2	No	29	58.0
	Total	50	100

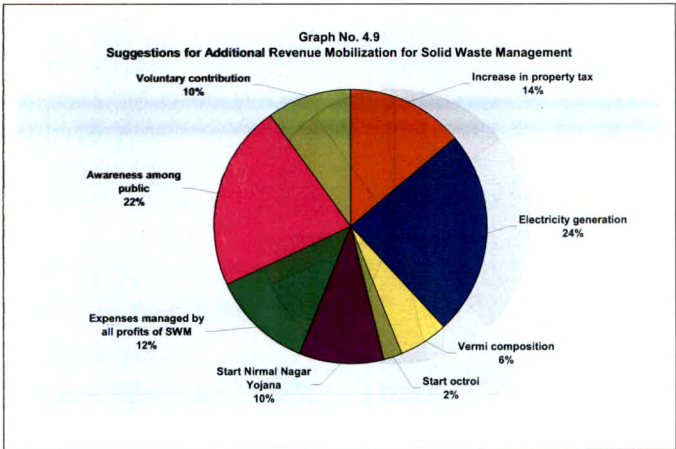
Source : Same as of Table No. 4.8

It is observed that financial adequacy of the Belgaum Municipal Corporation has contributed for inadequate and inefficient management of solid waste in the city.

**Table No. 4.20**  
**Suggestions for Additional Revenue Mobilization for Solid Waste Management**

Sr. No.	Suggestions	Frequency	Percentage
1	Increase in property tax	07	14.0
2	Electricity generation	12	24.0
3	Vermi composition	03	06.0
4	Start octroi	01	02.0
5	Start Nirmal Nagar Yojana	05	10.0
6	Expenses managed by all profits of SWM	06	12.0
7	Awareness among public	11	22.0
8	Voluntary contribution	05	10.0
	Total	50	100

Source : Same as of Table No. 4.8



It is revealed that the additional revenue mobilizing is necessary for proper management of solid waste by the Belgaum Municipal Corporation can be materialized through electricity generating, awareness among people and increase in property tax on house etc.

#### **4.9 Concluding Remarks**

The study of solid waste management practices in Belgaum city reveals that it is not proper management. The corporation has not succeeded in performing that duty. It is not eco-friendly in the society. The participation of people and other sections of the society is inadequate. Finance is inadequate necessary for this duty. The participation of NGO's NCC, NSS should be promoted. More importantly, citizens of the Belgaum should participate whole heartedly and contribute money necessary for that. Thus, solid waste management by the Belgaum Municipal Corporation is inadequate, inferior and not eco-friendly.

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