CHAPTER- V
FINDINGS, CONCLUSIONS AND SUGGESTIONS

5.1 INTRODUCTION
The present study gives an insight into the solid waste management practices adopted by selected municipalities of Satara, Solapur and Kolhapur districts. The observations and findings of this study are based on survey of the selected municipalities of above districts. The data thus generated is compiled and analyzed in the previous chapter; interpretation and inferences are drawn there from. Based on this analysis, findings, conclusions, and suggestions related to solid waste management practices adopted by selected municipalities are presented in this chapter.

5.2 FINDINGS
1. Majority of the stakeholders (57.19%) belong to the age group of 30-40 years followed by 27.11% that belong to the age group of 20-30 years, 11.4% respondents belong to the age group of 40-50 years and 4.29% respondents fall under the age group of 50-60 years.
2. The district wise analysis shows that respondents of municipalities from Kolhapur (61.87%), municipalities from Satara (54.88%) and municipalities from Solapur (54.83%) districts belong to the age group of 30-40 years. 32.95% respondents from municipalities of Kolhapur, 25.91% respondents from municipalities of Satara and 22.48% respondents from municipalities of Solapur fall under the age group of 20-30 years.
3. The gender wise analysis shows that the percentage of male respondents is slightly more than the female with a percentage of 50.25% and 49.75% respectively.
4. Majority of the respondents (64.27%) surveyed were graduates followed by 23.10% Post graduates, 10.2% respondents with qualifications of 11th or 12th and 2.62% with qualifications of 10th and below.
5. Majority of the respondents (96.54%) are married.
6. The distribution of stakeholders’ monthly income shows 33.81% falling in the income bracket of Rs. 20000 to Rs 30000, followed by 24.20% falling in the income bracket of Rs. 10000 to Rs. 20000, 18.26% respondents, monthly income is above Rs.
40000, 15.3% respondents fall in the income bracket of Rs. 30000 to Rs. 40000 and 8.2% respondents’ monthly income is between Rs. 1000 to Rs. 10000.

7. The analysis of respondent’s occupation shows that majority of the respondents (48.94%) are salaried and also engaged in their own business. The percentage of salaried respondents is 86.32% and those engaged in business is 13.68%.

8. The distribution of family size of the respondents is 30.55% respondents family size is five and above, 27.62% respondents’ family size is four, 23.88% respondent’s family size is three and 17.17% respondent’s family size is two.

9. The standard of living of 43.00% respondents is medium, 31.89% respondents have a low standard of living and 25.09% respondents have a high standard of living.

10. It is also observed that, the noise pollution score is significantly higher in municipalities from Satara district as compared to other municipalities from two districts. That is municipalities from Satara district face high degree of seriousness of problem of noise pollution.

11. It is also observed that, the water pollution score is significantly higher in municipalities from Solapur district as compared to other municipalities from two districts. That is municipalities from Solapur district face high degree of seriousness of problem of water pollution.

12. It is also observed that, the solid waste management score is significantly higher in municipalities from Satara district as compared to other municipalities from two districts. That is municipalities from Satara district face high degree of seriousness of problem of solid waste management.

13. It is also observed that, the air pollution score is significantly higher in municipalities from Solapur district and Kolhapur district as compared to municipalities from Satara district. That is municipalities from Solapur district and Kolhapur district face high degree of seriousness of problem of air pollution.

14. It is also observed that, poor road conditions score is significantly higher in municipalities from Solapur district as compared to other municipalities from two districts. That is municipalities from Solapur district face high degree of seriousness of problem of poor road conditions.

15. It is also observed that, traffic congestion score is significantly higher in municipalities from Kolhapur district as compared to other municipalities from two
districts. That is municipalities from Kolhapur district face high degree of seriousness of problem of traffic congestion.

16. It is also observed that, the problem of stray dogs score is significantly higher in municipalities from Solapur district as compared to other municipalities from two districts. That is municipalities from Solapur district face high degree of seriousness of problem of stray dogs.

17. The study reveals that the respondents belong to municipalities from Satara district face higher public nuisance problems as compared to municipalities from Kolhapur district.

18. The study reveals that respondents belong to municipalities from Solapur district face high public nuisance problems as compared to municipalities from Satara district.

19. The study reveals that respondents belong to municipalities from Solapur district face high public nuisance problems as compared to municipalities from Kolhapur district.

20. It is observed that, the plastic waste is collected in municipalities belonging to Kolhapur (79.6%), Solapur (56.5%) and Satara (65.1%) districts followed by other types of waste.

21. The respondents belonging to municipalities from Kolhapur (97.1%), Satara (95.1%) and Solapur (94.5%) district use plastic containers for household waste collection followed by metal container.

22. The respondents belonging to municipalities from Kolhapur (89.8%), Satara (67.4%) and Solapur (60.8%) districts generate solid waste at the most up to one container in their house.

23. The respondents belonging to municipalities from Kolhapur (72.1%), Solapur (54.7%) and Satara (53.8%) district usually have a small size container to collect household waste in their houses.

24. The respondents belonging to municipalities from Solapur (56.0%), (55.7%) Kolhapur and (45.3%) Satara district usually do not cover the household waste collection container in their houses.

25. The respondents belonging to municipalities from Kolhapur (90.9%), Solapur (88.1%) and Satara (70.3%) districts do not separate household waste collection container in their houses for waste collection.
26. The respondents belonging to municipalities from Kolhapur (98.7%), Satara (98.5%) and Solapur (92.2%) districts emptied their household waste collection container once in the day.

27. The respondents belonging to municipalities from Kolhapur (88.1%), Satara (78.3%) and Solapur (76.6%) district empty their household waste containers into the Public bin or in the Ghantagadi.

28. The respondents belonging to municipalities from Solapur (97.9%), Satara (83.6%) and Kolhapur (67.3%) district agree that, the municipalities provide them with the public bin as well as Ghantagadi to put away household waste.

29. The respondents belonging to municipalities from Satara (83.5%), Solapur (81.3%) and Kolhapur (79.9%) agree that the Ghantagadi does not come at right time for collection of household waste.

30. The respondents belonging to municipalities from Satara (100%), Kolhapur (100%) and Solapur (100%) district agree that the Ghantagadi come at their doorstep to collect the household waste.

31. The respondents belonging to municipalities from Kolhapur (76.5%), Satara (37.9%) and Kolhapur (36.4%) district agree that the condition of ghantagadis when it arrives to their house is full.

32. It is observed that the common solid waste management practices adopted by the municipalities are provision of public bins for domestic premises, provision of public bins for commercial premises, cleaning the toilets, street sweeping, grass cutting, removal of dead animals, provision of house to house waste collection container, provision of special awareness campaign for the citizens.

33. The respondents belonging to municipalities from Satara (43.6%), Solapur (26.0%) and Kolhapur (11.1%) district agree that concern officers do not motivate them to do work regarding solid waste management practices in their municipalities.

34. The respondents belonging to municipalities from Solapur (48.6%), Kolhapur (44.0%) and Satara (35.5%) districts strongly agree that there is lack of sound planning regarding solid waste management practices in municipalities.

35. The respondents belonging to municipalities from Satara (46.1%), Kolhapur (22.4%) and Solapur (14.0%) districts agree that they use obsolete equipments in process of solid waste management.
36. The respondents belonging to municipalities from Solapur (64.4%), Kolhapur (50.2%) and Satara (50.0%) districts strongly agree that there is lack of adequate number of vehicles required for transportation of solid waste from one place to another.

37. The respondents belonging to municipalities from Satara (64.9%), Solapur (62.11%) and Kolhapur (46.3%) districts strongly agree that there is problem of poor maintenance of transport vehicles in the Solid Waste Management.

38. The respondents belonging to municipalities from Satara (62.4%), Solapur (59.8%) and Kolhapur (51.7%) districts strongly agree that there is poor management of solid wastes in the Solid Waste Management in their municipalities.

39. The respondents belonging to municipalities from Solapur (77.8%), Satara (64.0%) and Kolhapur (53.4%) districts strongly agree that there is problem of lack of funds for solid waste management.

40. The respondents belonging to municipalities from Kolhapur (68.1%), Satara (67.2%) and Solapur (60.9%) districts strongly agree that citizens are not aware about Solid Waste Management practices.

41. The respondents belonging to municipalities from Solapur (80.6%), and Satara (77.1%), Kolhapur (75.0%) districts strongly agree that citizens do not co-operate properly in the process of Solid Waste Management.

42. It is also observed that, the lack of proper planning and execution scores is significantly higher in municipalities from Solapur district as compared to other municipalities from two districts. That is municipalities from Solapur district face problem of proper planning and execution of solid waste.

43. It is observed that the lack of motivation in the staff scores is significantly higher in Satara district municipalities as compared to other two district municipalities. That is municipalities from Satara district have one of the measure problems of lack of motivation in the staff.

44. It is observed that, use of obsolete equipments to the waste collection scores is significantly higher in Satara district municipalities as compared to other two district municipalities. That is municipalities from Satara district have used more obsolete equipments for collection of waste.

45. It is observed that, use of inadequate vehicles for waste collection and waste transportation scores is significantly higher in Satara district municipalities as compared
to other two district municipalities. That is, municipalities from Satara district have used more inadequate vehicles for waste collection and waste transportation.

46. It is observed that, poor maintenance of vehicles scores is significantly higher in Satara district municipalities as compared to other two districts municipalities. That is municipalities from Satara district do not maintain their vehicles properly.

47. It is observed that, poor public bin management score is significantly higher in Satara district municipalities as compared to other two district municipalities. That is public bin management is not satisfactory in the municipalities from the Satara district.

48. It is observed that, the lack of funding by Government scores significantly higher in Solapur district municipalities as compared to other two district municipalities. That is municipalities from Solapur district face the problem of lack of funding by the Government.

49. It is observed that, the lack of public awareness scores is significantly higher in Satara district municipalities as compared to other two district municipalities. That is citizens of municipalities of Satara district are not aware about the solid waste management.

50. It is observed that, lack of public cooperation in the solid waste management practices adopted scores is significantly higher in Solapur district municipalities as compared to other two district municipalities. That is citizens from municipalities of Solapur district are less cooperative to the municipalities in the process of solid waste management.

51. It is observed that, the major problems faced by the municipalities are lack of proper planning and execution, lack of motivation in the staff, use of obsolete equipments to the waste collection, use of inadequate vehicles for waste collection and waste transportation, poor maintenance of vehicles, poor public bin management, lack of funding by Government, lack of public awareness towards solid waste management and lack of public cooperation in the solid waste management.

52. It is observed that, the low morale of the staff scores is significantly higher in Solapur district municipalities as compared to other two district municipalities. That is staff of the municipalities from Solapur district has face the problem of low morale.

53. It is observed that, use of inadequate vehicles for waste collection and waste transportation scores is significantly higher in Satara district municipalities as compared
to other two district municipalities. That is, municipalities from Satara district have used more inadequate vehicles for waste collection and waste transportation.

54. It is observed that, the lack of public awareness scores is significantly higher in Satara district municipalities as compared to other two district municipalities. That is citizens of municipalities of Satara district are not aware about the solid waste management.

55. It is also observed that, the lack of proper planning and execution scores is significantly higher in municipalities from Solapur district as compared to other municipalities from two districts. That is municipalities from Solapur district face problem of proper planning and execution of solid waste.

56. It is observed that, poor public bin management score is significantly higher in Satara district municipalities as compared to other two district municipalities. That is public bin management is not satisfactory in the municipalities from the Satara district.

57. It is observed that, lack of landfill management scores is significantly higher in Kolhapur district municipalities as compared to other two district municipalities. That is Kolhapur district municipalities face the problem of management of landfill.

58. Hence it is observed that problems faced by the stakeholders are low morale of the staff, inadequate no of waste transport vehicles, lack of public awareness regarding solid waste management, lack of planning and execution, lack of public bin management and lack of landfill management.

59. It is observed that, a major problem faced by the municipalities’ scores is significantly higher in Solapur district municipalities. That is municipalities from Solapur district face more problems in management of solid waste.

60. The average mean of performance of timely collection of waste in municipalities from Kolhapur district (3.64) is greater than municipalities from Satara District (3.50) and municipalities from Solapur district (3.27).

61. The average mean of performance of waste disposal methods of the municipalities in municipalities from Kolhapur district (3.07) is greater than municipalities from Satara district (3.00) and municipalities from Solapur District (2.50).

62. The average mean of performance of budgetary allocations in municipalities from Satara district (2.76) and municipalities from Kolhapur district (2.70) are greater than municipalities from Solapur District (2.36).
63. The average mean of performance of placement of public bins in municipalities from Satara district (2.58) is greater than municipalities from Solapur District (2.32) and municipalities from Kolhapur district (2.27).

64. The average mean of performance of regular replacement of public bins in municipalities from Satara district (2.72) is greater than municipalities from Solapur District (2.34) and municipalities from Kolhapur district (2.32).

65. The average mean of performance of adequate equipments of waste collection in municipalities from Satara district (2.78) is greater than municipalities from Kolhapur district (2.65) and municipalities from Solapur District (2.34).

66. The average mean of performance of dumping site management in municipalities from Satara district (2.76) and municipalities from Kolhapur district (2.69) is greater than municipalities from Solapur District (2.33).

67. It is observed that the municipalities burn the generated waste to reduce the volume of the waste.

68. It is observed that the municipalities are not followed the waste handling rules.

69. It is observed that the municipalities are not given prime importance to the management of solid waste.

70. Most of the staff (87.03%) (Chief Officer and Health department employees) agree that town population is increased during the Town festival (yatra) followed by (74.07%) weekly bazaar and (61.11%) vacations.

71. Most of the staff (92.59%) (Chief Officer and Health department employees) agree that they managed the increased waste generated by floating population by increasing the number of temporary staff followed by (88.88%) increasing the working hours.

72. Most of the staff (77.78%) (Chief Officer and Health department employees) agree that excess quantity of waste generated per day by floating population is at most 10 tones.

73. Most of the staff (77.78%) (Chief Officer and Health department employees) agree that municipalities have provided the composting plant followed by (44.44%) sufficient landfill provision and (29.62%) vermi composting plant.
5.3 CONCLUSIONS

1. The strategies regarding basics of planning such as town planning layouts, transportation schedule, and allocation of appropriate vehicles are not updated. The present planning of solid waste management system totally depends on past experiences only. Therefore it is concluded that the solid waste management in the selected municipalities is lacking in proper planning.

2. The strategies regarding proper execution of solid waste management such as timely collection of waste, proper route map for waste collection vehicle and landfill management are not executed properly. Therefore it is revealed that the solid waste management in the selected municipalities is lacking in proper execution.

3. The study reveals that the waste generated is mostly plastic waste.

4. It is concluded that the citizens use plastic containers for collection of the waste in their houses. At the most two small size containers are required for collection of the household waste. The citizens do not cover the waste containers in their houses. Separate containers are not maintained to collect the dry and wet waste.

5. It is concluded that the citizens empty the household waste collection container once in a day in public bins or in ghantagadi.

6. It is revealed that municipalities provide ghantagadis at the door step of the citizens for waste collection. But the citizens have to face the irregularity of ghantagadis. Mostly ghantagadis are totally full with waste while visiting to the houses of the citizens.

7. The study reveals that the type of vehicle employed for collection of garbage in the town municipalities largely depends on waste generated per day.

8. It is concluded that selected municipalities of districts do not replace the public garbage bins regularly.

9. It is revealed that the equipments used for solid waste management in the selected town municipalities are obsolete. New equipments are not purchased frequently which adversely affect the solid waste collection and transportation.

10. It is concluded that the numbers of transport vehicles for solid waste management in the selected town municipalities are inadequate due to lack of funds or diversion of funds to any other project.
11. It is revealed that due to management hassles and mismanagement of monitory policies the transport vehicles used for solid waste collection in the municipalities are not properly maintained.

12. It is concluded that the citizens are not aware about solid waste management in the selected municipalities.

13. It is concluded that the citizens are not cooperating properly in the process of solid waste management in the selected municipalities.

14. It is concluded that the selected municipalities face the following problems regarding the solid waste management 1) Lack of proper planning and execution. 2) Lack of motivation in the staff. 3) Use of obsolete equipments to the solid waste collection. 4) Use of inadequate vehicles for waste collection and waste transportation. 5) Poor maintenance of vehicles 6) Poor public bin management. 7) Lack of funding by Government 8) Lack of public awareness towards the solid waste management 9) Lack of public cooperation in the solid waste management.

15. It is revealed that the stakeholders of the selected municipalities face the following problems regarding the solid waste management. 1) Low morale of the staff. 2) Inadequate waste transport. 3) Lack of public awareness. 4) Lack of planning and execution. 5) Lack of public bin management. 6) Lack of landfill management.

16. The study reveals that the performance of timely collection of waste, waste disposal methods, budgetary allocation, placement of public bins, regular replacement of public bins, adequate equipments for waste collection and dumping site management of selected municipalities is average whereas performance of separate collection of dry and wet waste in the selected municipalities is poor.

17. It is concluded that at the present condition public bin sites, waste collection frequency, waste collection methods, waste separation methods and waste recycling system implemented in municipalities are not satisfactory.

18. It is concluded that in the selected municipalities of sample district there is no feedback mechanism regarding solid waste management practices.

19. Town population is mostly increased during the town festivals such as Yatra.

20. The increased waste generated by floating population is mostly managed by increasing the number of temporary staff in the solid waste management process.

21. At most 10 tones excess waste is generated during the floating population.
22. Most of the municipalities have a composting plant.

5.4 SUGGESTIONS

SUGGESTIONS FOR MUNICIPALITIES

1. This study suggests that since Panhala is a tourist centre and attracts sizeable number of tourists throughout the year, the Panhala town municipality should adopt the practice of placing garbage bins at public places to avoid littering.
2. It is suggested that all the town municipalities should have disposal of carcasses of dead animals on the top of their agenda so as to avoid spread of diseases.
3. Collection of garbage and keeping the town clean and hygienic is an important civic activity. The people involved in this activity have to do a very cumbersome job hence to ensure that they do their job properly; they have to be a highly motivated. Hence it is suggested that the authorities of the health department should use various motivational techniques and get the work done to the expectations of all the stakeholders.
4. The study suggests that a sound planning mechanism should be designed involving representatives from general public so as to take care of uncertainties. Thus making solid waste management satisfactory.
5. This study would like to suggest that since modern equipments are available for solid waste management; proper training should be extended to the staff to optimize the use of these equipments.
6. It is suggested that the staff should be properly trained in solid waste management practices.
7. The success of solid waste management depends largely on the cooperation from the citizens, general public and establishments. Therefore it is suggested the authorities of the town municipalities should organize public awareness campaigns regularly to educate the people and gain their cooperation.
8. This study has identified and examined the nine major problems facing solid waste management in the town municipalities viz. lack of proper planning and execution, lack of motivation in the staff, use of obsolete equipments to the waste collection, use of
inadequate vehicles for waste collection and waste transportation, poor maintenance of vehicles due to the management hassles, overall public bin management, lack of funding by Government, lack of public awareness towards solid waste management and lack of public cooperation in the solid waste management. Hence it is suggested that the authorities should address these problems to make solid waste management successful.

9. This study suggests that the authorities should visit town municipalities/ municipal corporations, which have successfully implemented SWM and make a study of such practices and implement them in their respective town municipalities.

10. This study suggests that street corners, roads, streets and areas around public garbage bins should be kept clean and hygienic by regular cleaning using water jets and disinfectants so as to keep away stray dogs and other rodents. This practice should be given top priority by all the town municipalities.

11. This study would like to suggest to the town municipality of Satara that modern equipments should be used for the purpose of solid waste management.

12. Although the dumping sites for waste are far away from the towns, proper dumping site management is necessary to avoid spread of diseases and pollution of ground water.

13. It is suggested that the planning cells for solid waste management in all the town municipalities should make use of modern tools and techniques for planning solid waste management.

14. It is suggested that modern tools like GIS and digital maps should be used for planning and execution of solid waste management in the town municipalities.

15. This suggests that timely availability of funds should be made for solid waste management. Unnecessary procedures should not hinder the work of solid waste management, which is the case as revealed by this study. Besides manpower requirement should also be planned well in advance for timely solid waste management.

16. The type of vehicles employed for garbage collection depends on the nature of garbage. However the town municipalities can be futuristic and employ vehicles that are suitable for collection of any type garbage so as to be prepared for any eventuality.

17. In the course of this study it was found that according to the officers of the health department the garbage collection follow a daily schedule however the citizens do not agree with this observation. Hence it is suggested that the authorities should follow a
strict time schedule and also ensure that the vehicles follow the schedule strictly by taking regular feedback from the residents of all the localities.

18. This study would like to suggest that good percentage of the citizens say that the public garbage bins are in not good condition and are do not replaced within time, the authorities should see to it that the practice of replacing bins is followed strictly and also the condition of the bins should be monitored on a daily basis.

19. It is suggested that the staff involved in garbage collection both public and domestic should be properly trained so as to ensure collection of garbage to the entire satisfaction of the citizens and general public.

20. This study would like the town municipalities to take a serious note of garbage segregation at the dumping sites. If the practice of garbage segregation according to the nature of garbage is not adopted, then it is very essential that the town municipalities should contemplate on this issue. It is further suggested that the town municipalities can employ the services of a third party for segregation of garbage and recycling or conversion to fuel.

21. The identification of a route for municipal solid waste collection vehicles is critical since the total amount of money spent for the collection, transportation and disposal of solid waste is spent on the collection, therefore it is suggested that small improvement in the collection operation can result to a significant saving in the overall cost.

22. The waste collection schedules, vehicle capacities and their characteristics are taken into consideration for logistic management therefore it is suggested that appropriate technique should be used to locate the shortest possible routes to collect waste from all the public bins in the study region.

23. A proper disposal of municipal solid waste is very necessary to minimize the environmental health impacts and degradation of land resources therefore it is suggested that 3R (Reuse-Recycle-Reduce) technologies should be used, which helps to minimize the problem related with generation and safe disposal practices of municipal solid waste and also saves productive land area.

24. Poor solid waste management system gives rise to several environmental and health problems. The share of private sector is very limited in the rural areas due to poverty of these communities and the lack of the recyclable material in the rural solid
waste generated. Therefore it is suggested that the share of private sector should be increased in the municipal solid waste management.

25. Lack of financial resources, lack in decision making, lack of facilities and lack of support from the Government and citizens are the major problems of the civic authorities. The researcher suggests that the local civic government should formulate a long-term and comprehensive solid waste management programs that would encourage and motivate the public to encourage their cooperation and participation. The local government should reach out and build partnership with non-government organizations, private sectors and civic organizations to mobilize resources. Effective educational campaign on appropriate and effective solid waste management practices should be conducted in the residential, institutional, industrial, hospitals and commercial establishments to promote public awareness.

26. It is suggested that any strategy implemented must be inclusive of the citizens that are producing the waste and who are affected by the waste in addition to the people who have the policy-making authority.

27. It is suggested to improve the design of policy initiatives aimed at integrating waste collection and disposal by incorporating the employment needs of the urban poor and migrants, with adequate attention to the occupational health aspect of these people.

28. It is also suggested that the ability to deal with new situation should be required for effective capacity building for the municipalities and communities toward participatory and good governance.

29. It is also suggested that the research institutions, NGO’s and International agencies can play an important role for managing household waste. Therefore municipalities should be required to take the help of these institutions for successful running of the solid waste management system.

30. It is suggested that to adopt an improved community based solid waste management program through conducting community awareness and education programs, improving the existing solid waste management program with the construction of a composting/dry waste segregation facility and providing education and sanitary working conditions for employees of the solid waste management program.

31. It is suggested to adopt community waste education is required to improve the urban environment. A sustained effort is needed to keep interest in the program elevated
and reach out to everyone in the community. Students have the potential to be useful active participants in building community awareness.

32. It is suggested that solid waste has to be disposed off scientifically through sanitary landfill and recyclable portion of the waste should be salvaged.

33. It is suggested that higher priority should be assigned to the management of municipal solid waste by the local authority and a system approach needs to be adopted for optimizing the entire operation of solid waste management encompassing segregation at source, timely and proper collection, transportation routes and types of vehicles and development and proper operation of sanitary landfill site.

34. The density of population along with number of offices and institutions are continuously increasing thus there should be effective management activity for managing the solid waste which is generated daily in the municipal area.

35. The researcher suggests that Electric Power Generation process can be fired by municipal solid waste as fuel in the boiler-steam-turbine system.

**SUGGESTIONS FOR GOVERNMENT**

1. It is suggested that Government should provide appropriate funds for the solid waste management to the municipalities.

2. The share of private sector is very limited in the rural areas and the lack of the recyclable material in their solid waste therefore it is suggested that government should take concrete decision on the share of private sector should be increased in the municipal solid waste management. Government should run the solid waste management system with private sector on BOT basis.

3. This study suggests enhancing the efficiency of the Government ventures in addressing the basic problems of the waste pickers, associated with deplorable working conditions, poor returns, exploitation and their everyday harassments.

4. Economists have developed an effective model for recycling of solid waste because of the awareness of public towards the effective solid waste management has been increased in United States and Europe therefore it is suggested that economists should develop the effective model for recycling of solid waste for India.
5. It is also suggested that the research institutions, NGO’s and International agencies can play an important role for managing household waste. Government should establish tie-ups with these NGO’s and International agencies and makes a concrete plan for municipal solid waste management.

6. It is suggested that Government should design community based solid waste management program through conducting community awareness and education programs, improving the existing solid waste management program with the construction of a composting/dry waste segregation facility and providing education and sanitary working conditions for employees of the solid waste management program.

7. It is suggested to the Government to design community waste education programme for improving the urban environment. A sustained effort is needed to keep interest in the program elevated and reach out to everyone in the community.

8. It is suggested to Government that they should adopt the solid waste management handling rules in the syllabus of every stream because students have the potential to be useful active participants in building community awareness.

9. It is suggested to Government that higher priority should be assigned to the management of municipal solid waste because mismanagement of solid waste is very harmful to the environment and the community.

**SUGGESTIONS FOR CITIZENS**

1. Citizens are not properly aware about solid waste management system therefore it is suggested that awareness amongst the citizens should be increased for proper composition of waste. It is the responsibility of every citizen to be an active part of municipal solid waste management system.

2. Citizens are also responsible for success of municipal solid waste management therefore it is suggested that they should cooperating to the staff of municipal solid waste management.

3. In the time of waste disposal it is required to separate the waste by their type. Most of the municipalities have not separated the waste and they burn the generated waste without separating. The fumes of the burning waste are harmful to the environment as
well as human being therefore it is suggested that citizens should separate the dry waste, wet waste, plastics etc in their houses.

4. Senior citizens or parents should guide to their children regarding proper handling of waste, waste management, waste reduction methods etc. It is suggested that that they should instruct time to time to their family members regarding solid waste management.

5. Citizens should follow the waste reduction techniques as reuse the waste and reduce the waste generation because waste will be the waste for someone but it will be the row material to another to make the new things.

6. Citizens should arrange the awareness programmes jointly with the local civic bodies at the time of festivals, birth day ceremony such as Ganesh festival, Shiv Jayanti, Mahatma Gandhi Jayanti etc. They are also organizing the awareness campaign on World Environment Day.

SUGGESTIONS FOR ORGANIZATIONS

1. It is suggested that the organizations should adopt the biological waste treatment such as composting. Composting is the process in which controlled aerobic decomposition has been done with the help of micro organisms and invertebrates.

2. It is suggested that organizations such as educational institutions should arrange orientation programme regarding the solid waste management for the students from schools and colleges.

3. It is suggested that the organizations should strictly avoid the use of plastic bags. It will help to decrease the generation of plastic waste.

4. The waste generated by the organizations is more therefore it is suggested to organizations that they should reduce the generation of waste.

5. It is suggested that the organizations should collect the dry and wet waste separately.

6. In the organizations such as hotels food waste generation is more therefore dump the food waste in ghantagadis or garbage collection van only not in public garbage bin because food waste attracts the dogs and other animals when dogs get into the public garbage bin they may be encouraged to return to the location because of the food reward.
5.5 SCOPE FOR FURTHER RESEARCH

The study elaborates the solid waste management practices adopted by selected municipalities of Satara, Solapur and Kolhapur districts only. Therefore there is scope for further research. This study was conducted with 9 municipalities which were selected by set criteria and cannot be generalized beyond that scope. The present work was undertaken as an exploratory study limited to study the solid waste management practices adopted by selected municipalities. Further study should include:

- A comparative study to find the effectiveness of solid waste management practices adopted by municipalities.
- A comparative study of solid waste management practices adopted by municipalities and municipal corporations.
- A study of solid waste management practices adopted by municipal corporations.

Research should be conducted at selected municipalities will be helpful to these municipalities to find their strengths and weaknesses regarding the solid waste management. This research will be helpful to municipalities to increase the effectiveness of solid waste management practices. The area of municipal solid waste management practices provides ample scope for future research studies.
5.6: CONCLUSION

The present study gives an insight into the study of Solid Waste Management practices adopted by the selected municipalities in Satara, Solapur and Kolhapur districts. The study focuses how solid waste management practices have been implemented by these municipalities. The study reveals how solid waste management practices in the selected municipalities perform and what are the major problems faced by these municipalities as well as the stakeholders. The observations and findings of this study are based on survey of the citizens, small business establishments and managers of organizations like hotels etc. on one hand and the chief officers, employees of the health department of the municipalities on the other. Based on the findings and observations made, this research has made some suggestions and recommendations. These suggestions and recommendations are pointers for the municipality administration to focus on facts like the success of municipal solid waste management depends on public awareness and cooperation hence suggestions like public awareness campaign. On the management side the municipalities need to implement modern techniques of solid waste management. This is possible if the entire staff of the municipal administration is intrinsically motivated and is forward looking so as to bring in modern practices like segregation of waste, transportation, dumping site management, etc. These modern practices may look out of place for these semi-urban/rural municipalities. However revolutionary changes among the people can be expected only through such initiatives by the government or local governing bodies. The suggestions and recommendations of the present study will be helpful to all the municipalities to understand the present status of solid waste management practices adopted and ways to enhance their performance for better solid waste management.