



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

# IJIRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 11, Issue 7, July 2022

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.118



9940 572 462



6381 907 438



ijirset@gmail.com



www.ijirset.com

# Assessment of Municipal Solid Waste in West Aurangabad, Maharashtra (India)

Jogdand Onkar<sup>1</sup>, Potadar Vishnu<sup>2</sup>, Pawar Supriya<sup>3</sup>

Assistant Professor, Department of Environmental Science, Deogiri College, Aurangabad, India<sup>1</sup>

Assistant Professor, Department of Environmental Science, Deogiri College, Aurangabad, India<sup>2</sup>

P.G. Student, Department of Environmental Science, Deogiri College, Aurangabad, India<sup>3</sup>

**ABSTRACT:** The development of civilization and rapid growth of industries create problems of increase in waste generation becomes more complex in urban regions. The composition and distinctiveness of the solid waste vary from region to region; factors which influence the amount and composition are the normal income level, the population, the sources, behavior of society, production from industries and market for the waste materials. The present work is an attempt to study the composition of municipal solid waste which is generated from representative residential region and characterization study of the collected waste from Vedant nagar of Aurangabad city. The study was carried out during last three months study period from January 2022 to March 2022. The results reveal that, the common degradable material present in the collected solid waste from representative houses in percent. The highest value of Vegetable and food waste was 30.8 % and minimum value was found 26.9% and average value was 28.58% .While the highest value of paper was 9.5 % and minimum value was found 8.1% and average value of paper waste was 8.71%. The highest value of plastic was 6.5 % and minimum value was found 4.5% and average value of plastic was 5.44%.The highest value of glass was 5.3 % and minimum value was found 4.1% and average value of glass was 4.68%.The highest value of metals was 5.2 % and minimum value was found 3.8% and average value of metals waste was 4.4%. The highest value of fine earth ash was 50.5 % and minimum value was found 44.9% and average value of fine earth ash was 48.54% and the highest value of miscellaneous was 7.8 % and minimum value was found 1.8% and average value of miscellaneous waste was 5.3%.Whereas the average non-degradable material present in the cumulative collected solid waste from chosen houses. In the present investigation the status of solid waste management and treatment practices in study area observed solid waste generation sources, handling, treatment and disposal method. The results shown that the composition of the waste in the city area is heterogeneous because it contains both biodegradable and non-biodegradable material such as E-waste, plastic, polythene material, hospital waste and domestic waste, among others. So that there is an urgent need of the proper waste collection, transportation route for the prevention of environment from the hazardous waste disposal.

**KEYWORDS:** Solid Waste, management, collection; disposal and environment

## I. INTRODUCTION

Solid wastes are the residual part of raw materials, which are generally unwanted after the primary use. Among the different waste materials, solid wastes are generated in our household through various human activities. In its significance, population and their education point, monthly income is also contributing factor in the waste generation [1,2]. The waste management is easy for the limited number of individuals [3]. However, in India due to the rapid growth in population together with modern civilization the lifestyle has also been simultaneously changed. In its connection, the indecent solid waste management improvises the exact outcome on the public health and environment. Accordingly, the solid waste management becomes a chief concern in the twenty-first century [3]. Numerous hazardous solid wastes [4] from the different sources are further characterized as reusable, organic and recyclable waste [5]. A solid waste mainly includes agriculture, municipal, village and the hospital solid wastes. Wastes contain a chief part of the decomposable and recyclable materials [6]. Agriculture solid wastes (ASWs) may put forth groundwater pollution and the soil infertility [1, 7]. Toxic organic materials and the metals are the major sources of contagious materials. The largest part of solid wastes are originated from municipalities where the quantity is thousands of tons per day; municipal solid waste contains all kinds of organic waste, hazardous and non-hazardous with few extents of MSW is compostable. The growing rate of MSW generation per annum is about 1–1.33% per capita. In India, the municipal solid waste generation rate per capita is around 0.2–0.5 kg per day in very small towns [8]. Solid waste causes release of many poisonous gases and the substances which further may contaminate the groundwater, soil and the environment.

## II. RELATED WORK

The huge quantities of e-waste are generated from the discarded electrical and electronic equipments. Fast obsolescence of technology reduces the lifetime of electrical and electronic product that in turn results in rapid improvement of e-waste [9]. These may cause bronchial maladies, damage in liver, lung cancer and kidneys. Some of heavy metals like, mercury, cadmium, arsenic and lead are present in e-waste possessing serious effect on the central nervous system, immunology system of our human health. On contamination to the groundwater, wastes may cause detrimental effect to children and cause several diseases (i.e. Minamata and Itai-Itai) [10]. Prior discussion, it could be understandable which shows the harmful effect of SW on human civilization is caused due to the improper management of solid waste. To minimize the undesirable effect and up growing quantity of the solid waste, proper management is very essential [11]. Solid waste management (SWM) process includes the various actions related to generation, collection, transfer, storage, transport, processing and disposal of the solid wastes [8]. Solid waste generation and its management depend upon the national income and legal policies of the country. Application and the maintenance of these facilities like recycling, treatment, collection and disposal of the solid wastes needs a large amount of finance. Likewise, for the waste treatment there is a need of suitable locations which may harder to find due to the most popular attitude throughout all the communities. Reduce, Reuse, Recycle (3Rs) and the integrated solid waste management pursue better interested on the waste prevention, reduction and waste recycling rather than the waste treatment and disposal [3, 5].

## III. METHODOLOGY

The solid waste from the different areas of West Aurangabad was collected which was prepared by using quartering method. The waste was then characterized and the percentage of each constituent was calculated. Secondary data regarding solid waste generation, collection system and disposal methods were collected from Aurangabad Municipal Corporation in Aurangabad city.



Fig.1. Study area map

The fundamental idea of the method was to develop the genuine approach which ranged from the identification of the waste generators, capacity building or participation and the choice of technology as well as policy options that enhance the sustainability of waste management. Qualitative information was gathered by arranging interviews with institutions and stakeholders which have different roles involved in the Solid Waste Management. Quantitative data was gathered by means of a questionnaire survey conducted on the household and individual level within the selected study regions. At the same time as secondary data relevant to the solid waste management in Aurangabad region have assembled from the national and international statistics, reports and various studies. Present research work aimed at an overall waste management system which is the best ecologically, economically sustainable for a particular area [12].



## IV. EXPERIMENTAL RESULTS

Table 1: Composition of Municipal Solid Waste (%) generated from West region of Aurangabad.

Colonies / Wards	Waste generation quantity in percent (%)						
	Vegetable and food waste	Paper	Plastic	Glass/ ceramics	Metals	Fine Earth ash	Miscellaneous
Vedant nagar	29.3	1.9	49.5	15.02	5.1	49.5	1.9
Railway station	27.4	3.2	50.1	14.62	3.8	50.1	3.2
Bansilal nagar	28.1	1.8	47.6	14.21	3.9	47.6	1.8
Eknath nagar	26.9	2.9	44.9	13.85	4.1	44.9	2.9
Jalan nagar	28.2	4.2	45.8	14.35	4.5	45.8	4.5
Peer Bazar	27.5	4.6	49.3	15.11	4.6	49.3	5.2
SBH Colony	29.2	4.5	46.9	15.20	5.0	46.9	6.7
Mhada colony	27.8	4.4	47.2	15.21	4.4	47.2	7.4
Osmanpura	28.5	4.3	50.1	15.50	4.3	50.1	5.8
Gopal Tea	28.9	4.2	50.5	15.70	4.2	50.5	7.8
Average	28.58	8.71	5.44	4.68	4.4	48.54	5.3
Minimum	26.9	8.1	4.5	4.1	3.8	44.9	1.8
Maximum	30.8	9.5	6.5	5.3	5.2	50.5	7.8

(All values were expressed in %)

The solid waste generation is growing day by day with increase in population. Only in India, it is ranged from 0.2–0.6 kg/capita in cities which generates 42 million tonnes of total solid waste every year and the volume will cross 260 million tonnes in 2047. The composition of Municipal Solid Waste generated from study area i.e. Vedant Nagar area of Aurangabad city the highest value of Vegetable and food waste was 30.8 % and minimum value was found 26.9% and average value was 28.58% . While the highest value of paper was 9.5 % and minimum value was found 8.1% and average value of paper waste was 8.71% . The highest value of plastic was 6.5 % and minimum value was found 4.5% and average value of plastic waste was 5.44%. The highest value of Glass was 5.3 % and minimum value was found 4.1% and average value of Glass waste was 4.68%. The highest value of metals was 5.2 % and minimum value was found 3.8% and average value of metals waste was 4.4%. The highest value of fine earth ash was 50.5 % and minimum value was found 44.9% and average value of fine earth ash was 48.54% and the highest value of miscellaneous was 7.8 % and minimum value was found 1.8% and average value of miscellaneous waste was 5.3%.

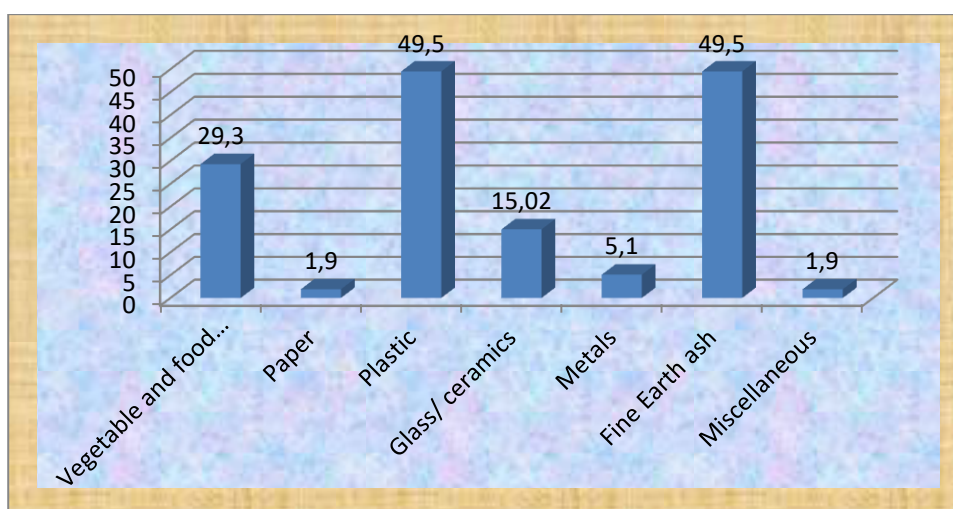


Fig.no.2 Composition of Municipal Solid Waste (MSW) in Vedant nagar area (%)

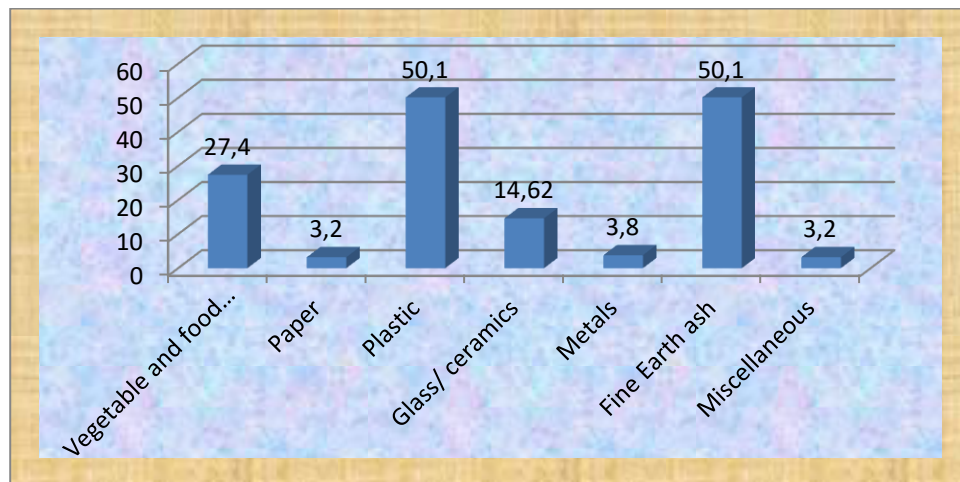


Fig.no.3 Composition of Municipal Solid Waste (MSW) in Railway station area (%)

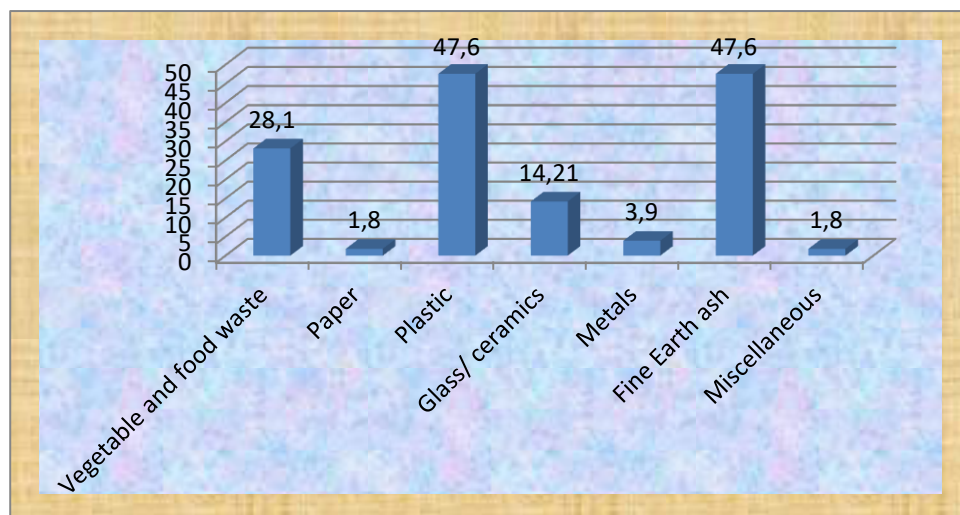


Fig.no.4 Composition of Municipal Solid Waste (MSW) in Bansilal nagar area (%)

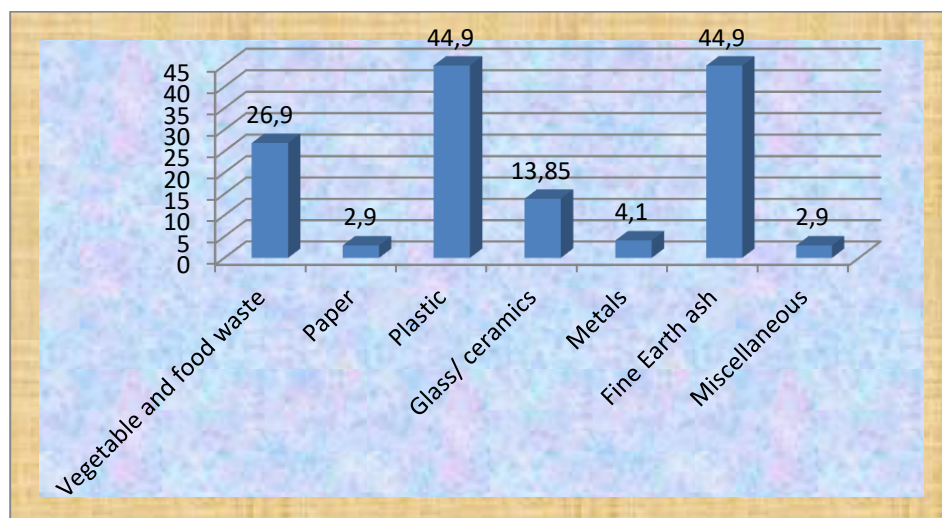


Fig.no.5 Composition of Municipal Solid Waste (MSW) in Eknath nagar area (%)

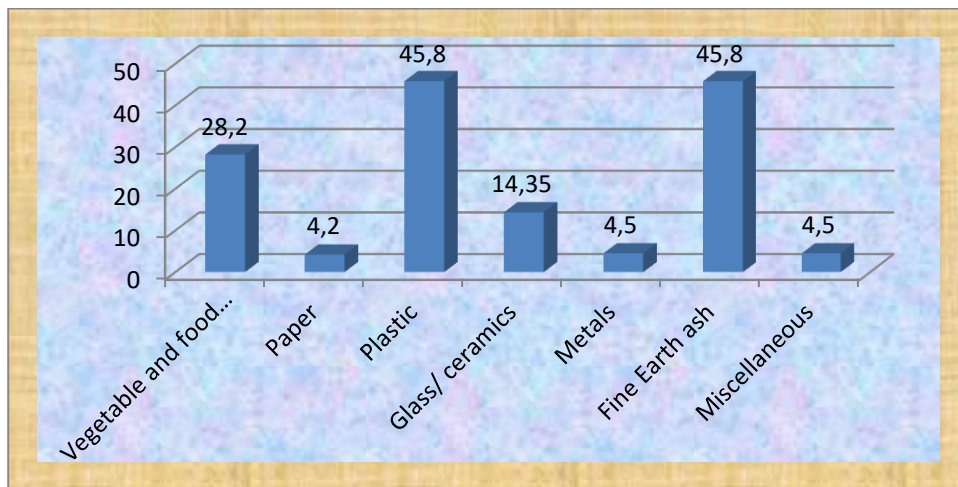


Fig.no.6 Composition of Municipal Solid Waste (MSW) in Jalan nagar area (%)

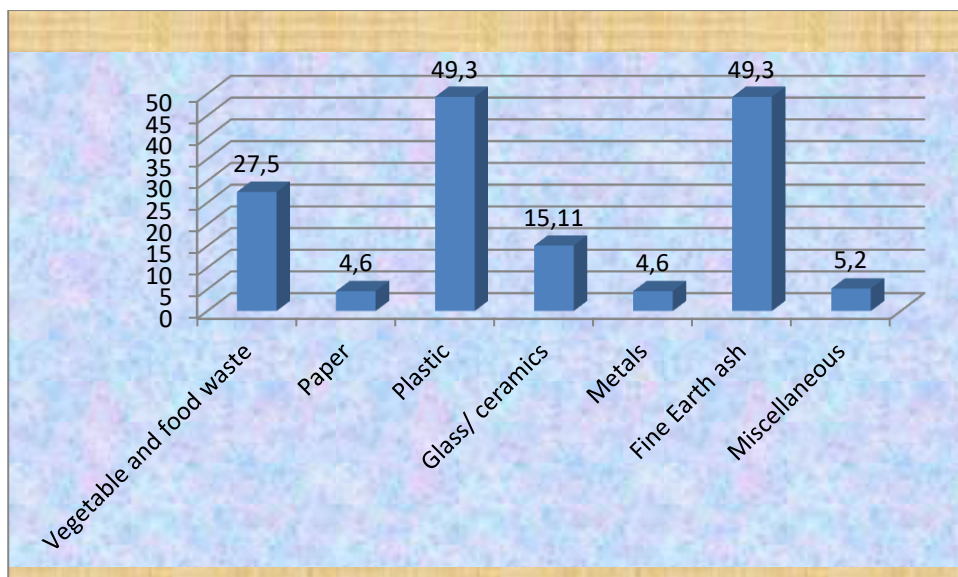


Fig.no.7 Composition of Municipal Solid Waste (MSW) in Peer Bazar area (%)

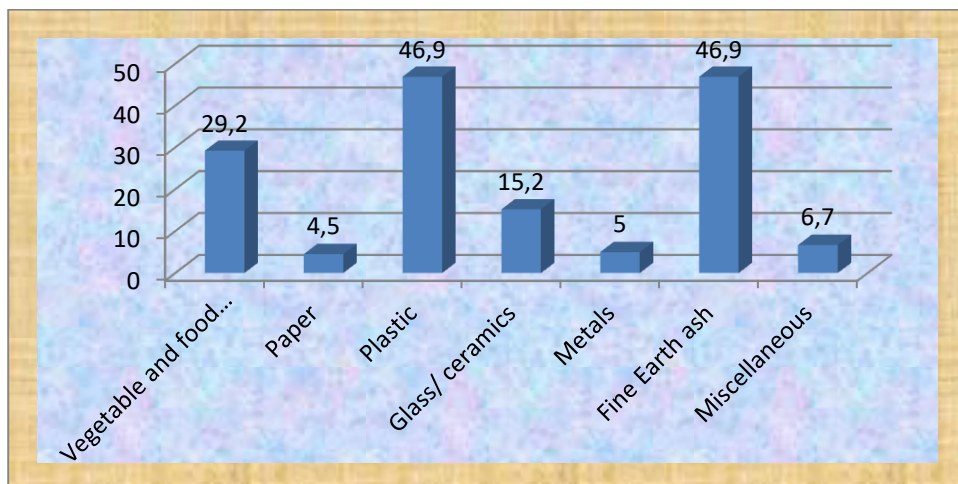


Fig.no.8 Composition of Municipal Solid Waste (MSW) in S.B.H.Colony area (%)

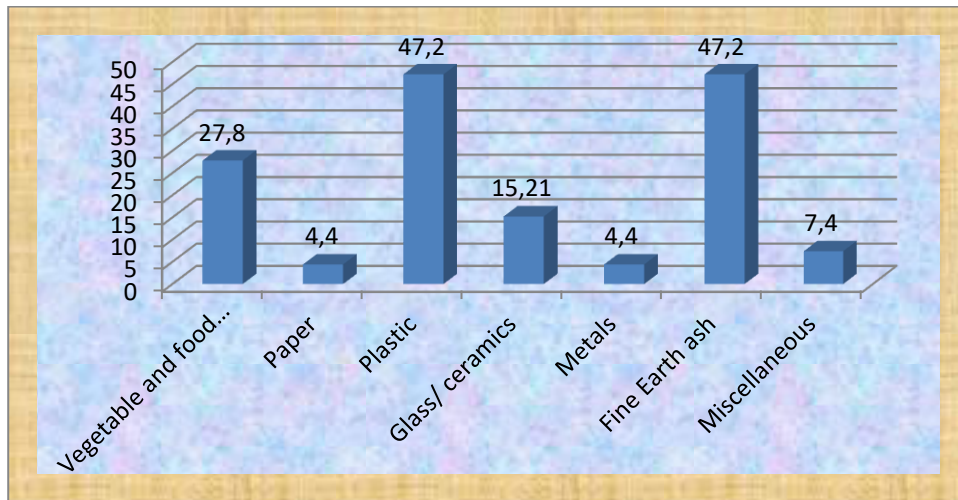


Fig.no.9 Composition of Municipal Solid Waste (MSW) in Mhada colony area (%)

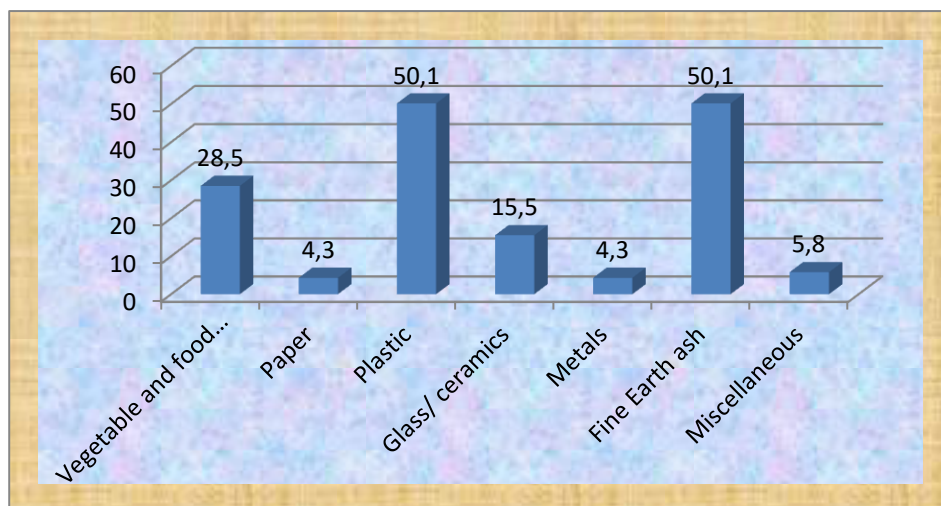


Fig.no.10 Composition of Municipal Solid Waste (MSW) in Osmanpura area (%)

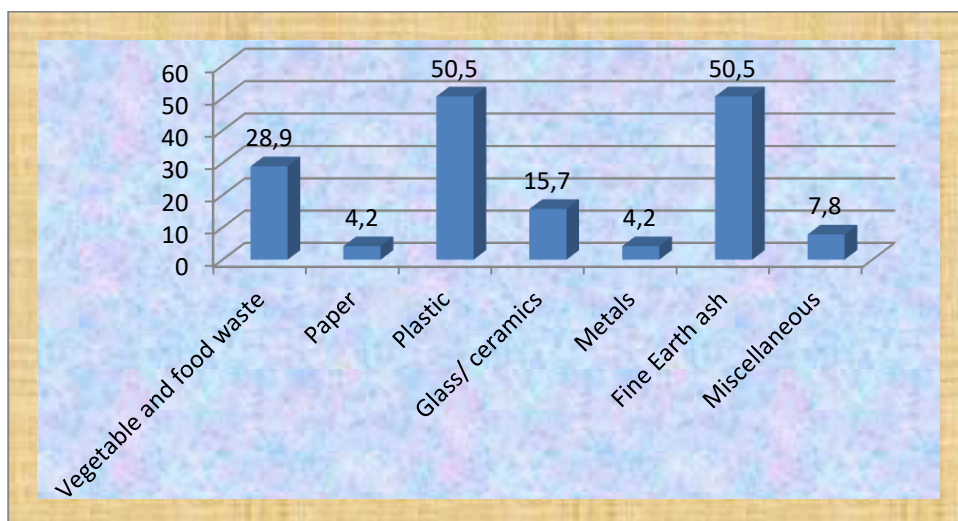


Fig.no.11 Composition of Municipal Solid Waste (MSW) in Gopal Tea area (%)



## V. CONCLUSION

Due to the urbanization, civilization and growth of population in the metropolitan cities creates an enormous quantity of municipal solid waste which is difficult to manage properly with the present management, human resources, infrastructures, economic support and technological capabilities. Door-to-door collection system needs to get support from all the stakeholders with proper awareness among the peoples, motivation and commitment campaign. Existing on-site storage practices should be changed immediately by adopting proper design and maintaining secondary disposal sites for transfer stations or hand over points, where it is applicable based upon the prevailing socio-economic aspects. Effectiveness of wastes transportation to the ultimate disposal sites must be improved with the participation of public and private sector with strict terms and conditions. The present scenario of waste management requires improvement by providing a sanitary landfill mechanism in the existing sites. Government support should be provided in composting sector for managing massive quantity of organic wastes. There should not be only one single solution for waste minimization; it must have many alternative ways of characterization. The proposed technique which is based on socioeconomic aspects, local needs and technological capabilities to ensure the acceptability of the adopted system and environmental friendly system.

## REFERENCES

- [1] Banerjee Priyabrata, Abhijit Hazra, Pritam Ghosh, Amit Ganguly, Naresh Chandra Murmu and Pradip K. Chatterjee (2016): Solid Waste Management in India: A Brief Review© Springer Nature Singapore Pte Ltd. 2019 S. K. Ghosh (ed.), Waste Management and Resource Efficiency.
- [2] Himabindu, P., Udayashankara, T. H., & Madhukar, M. A. (2015): Critical review on biomedical waste and effect of mismanagement. International Journal of Engineering Research & Technology, 4(03), 0181–2278.
- [3] Giusti, L. (2009). A review of waste management practices and their impact on human health. Waste Management, 29, 2227–2239.
- [4] Singh, H., Rehman, R., & Bumb, S. S. (2014): Management of biomedical waste: A review. Journal of Dental and Medical Research, 1(1), 14–20.
- [5] Shanghai manual (2010): A guide for sustainable urban development in the 21st century (Chapter 5).
- [6] Gowda, M. C., Raghavan, G. S. V., Ranganna, B., & Barrington, S. (1995): Rural waste management in a South Indian Village a case study. Bioresource Technology, 53, 157–164.
- [7] Sims, J. T., & Wolf, D. C. (1990): Poultry waste management: Agricultural and environmental issues. Academic Press.
- [8] Sharholi, M., Ahmad, K., Mahmood, G., & Trivedi, R. C. (2008): Municipal solid waste management in Indian cities—A review. Waste Management, 28, 459–467.
- [9] Gaidajis, G., Angelakoglou, K., & Aktsoglou, D. (2010): E-waste: Environmental problems and current management. Journal of Engineering Science and Technology Review 3(1), 193–199. 1048.
- [10] Banerjee P. Kiddee, P., Naidu, R., & Wong, M. H. (2013): Electronic waste management approaches: An overview. Waste Management, 33, 1237–1250.
- [11] Annepu, R. K. (2012): Sustainable solid waste management in India report. New York City: Columbia University.
- [12] World Resource Foundation (1996), “So what is integrated waste management? Warmer Bulleting: Journal of the World Resource Foundation, No. 49.





**INNO SPACE**  
SJIF Scientific Journal Impact Factor  
**Impact Factor: 8.118**



**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
**INDIA**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 **9940 572 462**  **6381 907 438**  **ijirset@gmail.com**



**www.ijirset.com**

Scan to save the contact details