

## **EXECUTIVE SUMMARY**

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## **INTRODUCTION:**

Waste management is closely linked to population, urbanization and affluence. Human dwellings and activities generate a considerable amount of waste. The amount of waste we generate, and its actual and potential impact on the environment has long been matters of concern to government and the community generally. Larger population density, increasing consumption rate, shortening of product life span is major reasons for increased waste in urban and sub urban areas. Waste management is a significant component of the environmental movement.

Everyone in the planet contributes to the problem and can be affected directly or indirectly if waste is not managed in appropriate way. Therefore everyone can contribute to the solution. Sustainable approach to the environmental problems requires the participation of multiple stakeholders. Globalization resulted in increased industrialization and urbanization. It leads to the introduction of various products to cater the needs of the consumer society. As a result more resources will be discarded and disposed off as waste. Besides fast changing life style in the urban centres have lead to the generation of huge amount of garbage providing basic amenities to the people in the urban areas is the major problem to the municipal corporations. Over the years handling of municipal solid waste has assumed the major organizational, financial, environmental challenges to the urban bodies. Inadequacy of other urban facilities like drains, roads, sanitary facilities often add to the problems of waste management. The interrelated nature of service problems needs active participation of residents.

Waste is the result of human activity. Solid waste is discarded non liquid materials from households, industrial and commercial establishments, institutions and streets that do not have value anymore in the eyes of the first user. Unwanted useless or rejected materials discarded are considered as solid waste (WHO 1982). Solid waste is basically classified as domestic waste, hospital waste and industrial waste. Degradable, non degradable waste

generated due to various social activities is considered as waste. (Jaswinder 2010). Every individual generate waste. Solid waste may include plastic, glass, waste food, waste cloth, metal bottle, paper, plastic bottles etc. 20% of the world's population lives in industrially developed nations. They consume 80% of the total and they generate 80% of the waste. However, in developing nations and under developed nations, improper waste management caused various environmental problems, particularly in urban areas

### **Need for waste management**

Waste management is all those activities and action required to manage waste from its inception to its final disposal. Waste management is intended to reduce adverse effects of waste on health, the environment aesthetic. Waste management practices vary from countries, regions and sectors. There is no single solution for the challenge of waste management.

The total process of collection, transportation, segregating and reuse and ultimate disposal of non-biodegradable waste is known as waste management. It is the duty and responsibility of every individual, institutions and organizations to preserve and protect the eco-system and environment. The need of the day is to sensitize people towards environmental issues. Environmental protection is not only pollution control, but also protecting the natural resources and striving to maintain the ecological balance. The need of waste management arises for the following reasons:

1. The natural resources available are exhaustive in nature. Though some resources are renewable, it takes centuries together for the same. So there is need for limited use of these scarce resources. As far as possible the waste generated from the use of these resources need to be reused.
2. The Biosphere is the layer of the planet earth where life exists. It contains oxygen, nitrogen, carbon dioxide and humidity which are required for the living organisms to live. These are in the right proportion which is needed for healthy living.  
If waste is not managed it may pollute the environment and may affect the ecological balance. If waste not managed it will have negative ecological impact.
3. Pollution control is a costly affair. Country like India must focus on waste management at the grassroots level itself. Priority should be given on recycling of waste, so that the impact of solid waste on environment can be reduced.

4. In India 80% waste flowing to water leading to water pollution. Present government has set aside in its budget more than 20,000 crores of rupees to clean river Ganga. It speaks about the vastness of the problem.
5. Due to heavy rain many times artificial flood calamities occur in cities. The main reason is unorganized urbanization and throwing the waste in open places, drainages etc.

### **Origin of the research problem:**

Solid waste management is one among the basic essential services by municipal authorities in the country to keep urban centers clean. At present most of the municipal solid waste in India is disposed off unscientifically. This has adverse impact on not only the ecosystem but also on the human environments. In more environmentally concerned nations the main concept is ensuring the harmonisation between human and environment.

In India the system of providing solid waste management service is unscientific, outdated and inefficient. Municipal laws governing the urban local bodies do not have adequate provisions to deal effectively with the ever growing problem of solid waste management. The success of solid waste management has been threatened by social risks associated with the inadequate inclusion of the public in decision making in solid waste management program.

### **Objectives of the Research study:**

The main objectives of this study are:

1. To study demographic and economic conditions of the people.
2. To know whether community pays fees for waste collection.
3. To know whether people classify their waste as degradable and non de gradable.
4. To study peoples satisfaction about the present system of waste management.
5. To know existence of citizen groups at ward level.
6. To study people's awareness about the need for public participation in waste management.

**RESEARCH METHODOLOGY** The study is conducted in Mangaluru city Corporation limits. To study the determinants influencing factors and independent factors, a structured questionnaire was prepared. The first part of the questionnaire consist of the background information of the respondents such as age, gender, educational qualification, occupation of family, family income, number of members in family and their place of living and business.

The second part of the questionnaire consists of the questions relating to the main purpose of the study. This part enables to the empirical study on the awareness of the respondents towards waste management and their participation level in waste management. The structured questionnaire was distributed to the respondents personally by the investigator and collected their responses at their respective homes. The respondents also include NGO's, elected representatives of City Corporation. Personal talks and exchange of information clarified the real situation of the work and contributed a lot to study this subject. Informal discussions were held with almost all the respondents. Information collected reflects the true opinion of the respondents and most of the respondents are sincere in responding.

#### **Area of Study:**

- ❖ **This Minor research study is carried out in Mangalore city corporation limits**
- ❖ **Sample Design:** The sample consists of 150 respondents from 60 wards of the Mangalore city corporation. The respondents are randomly selected from all the wards.

#### **Summary of Observations**

1. Out of the 150 respondents, 86% are female and 14% are male. This shows women play a major role in waste handling and household waste is more effectively handled by women.
2. 60% of the respondents are in the age group of 41 – 60 years and 4% are in the age group of 60 years and above. The lowest age group is 14 – 25 years and 17% belongs to this age group. It only indicates the youngsters and aged people are less involved with handling the waste.
3. The data on the size of house hold reveals that 58% of the respondents live in a family size of 2 – 4 and lowest of 4% live alone. 5% respondents belong to the family size of 8 and above. It indicates that majority of families are nuclear in size.
4. The occupational background of the respondents reveal that maximum of 33% depend on private organizations in the municipality area of their livelihood.
5. The income distribution of respondents show that a maximum of them live in low income category of Rs. 11,000 – 50,000, i.e. 27% of the respondents live in this category. The people live in the income category from Rs. 50,000 – 3,00,000 is 44%. Respondents under upper income limit of 10 lakhs and above are only 3.
6. One of the objectives of the study is to know the awareness of the respondents about solid waste management. The data reveal that people are aware of the need for solid waste management. 76% of the respondents aware of solid waste management. At the

same time 11% of the respondents could not tell whether they are aware or not aware of the solid waste management.

7. For 47% of the respondents municipality is the source of information on solid waste management.
8. 60% of the respondents store the garbage before disposal, however nearly 40% still do not store the garbage. It indicates that these 40% throw the garbage in the open space or to a water drainage leading to pollute the environment.
9. 79% of the respondents bring the waste to the collection point. This shows that they are particular in systematic way of disposing the waste.
10. The respondents view on segregating the waste shows that only 53% of them segregate the waste, and 47% do not segregate. It says the attitude of the people in handling the waste. Their attitude is 'out of site is out of mind'. They just want to get rid of the waste generated in their place and least bothered the impact of non segregation of the waste.
11. 57% of the households store the dry waste and sell it. 5% do not take any step to manage their waste.
12. 41% of the respondents are involved in cleaning their surroundings on daily basis and 7% do not take any interest in cleaning their surroundings.
13. 97% of the respondents happy that the waste collection vehicle reaches their locality.
14. The view on the satisfaction levels of respondents states that 69% of them are happy with the sanitation service provided by the municipal corporation.
15. 91% of the respondents consider their participation in waste management is required. It suggests that people are aware of the impact of solid waste management and they want a better living atmosphere.
16. Though majority of the respondents consider public participation in waste management is important, 60% do not participate in any waste management awareness programmes.
17. 51% of the respondents do not participate in the work of waste management carried out in their locality.
18. 53% of the respondents are happy with their level of participation in waste management. As stated above, participation may be in the form of storing the waste, recycling and reuse of the waste. At individual level every one can participate in waste management.

19. For a question on payment of fees for waste disposal, the respondents opine that 55% of them pay fees and 45% say that they do not pay any fees. However, it is to note that the municipal corporation collects waste management tax through property tax from 2014 onwards.
20. For a question on existence of citizen group in the locality, 72% of respondents said that there is no citizen group in their locality. It says that though people are aware about need for their participation, they do not show any active involvement in the waste management of their locality.
21. With respect to regular meeting of the citizen groups, 8% say that no such meetings are conducted on regular basis. It indicates that though there are groups in certain locality, meetings are conducted rarely.
22. 76% of the respondents are happy with the service provided by the present system of waste collection in the city.
23. 68% of the respondents are aware of the budget allocation of the municipal corporation for waste management.
24. 61% of the respondents are happy with the present system of waste monitoring done by the municipal corporation.
25. Though less percentage of people involve themselves in waste management activities, 86% of them are aware that unscientific disposal of waste causes damage to the environment.
26. For a question on whether public can influence the way waste is managed, 94% of the respondents is of the opinion that they can influence.
27. 77% of the respondents agree that reducing the waste is the best way to manage the waste.

### **Suggestions and Recommendations**

1. Though people are aware about impact of unscientific disposal of solid waste management, they throw the waste on public drainage in the open space. Here people need to be educated and they need to be identified and action needs to be taken against them. In countries like Sri Lanka people will be behind bars if they throw waste in public place.
2. Though the waste collectors in the municipal area made an attempt to educate the people on waste segregation as dry and wet, a large number of people do not do it. Hence more awareness programmes are required. The corporation or waste collectors can take the help of NSS or NCC students and other social service organizations,

voluntary service organizations to create awareness programmes in a massive scale by visiting each house.

3. Apartments, hotels, market centers, big commercial complexes where large quantity of waste is generated can have their own facilities to manage the waste scientifically. Licenses may be given to them only if they have a proper plan to dispose the degradable waste within their vicinity. They should be supported to have their own composting system to manage food waste, vegetable waste and other biodegradable waste.
4. Municipality need to be more transparent and educate the people regarding ward wise budget allocation, waste collectors information, sale of manure and revenue generated etc.. They must settle the waste collectors due in time. Solid waste management is one activity where public participation is key to success. Unless people take active participation it is not easy to the municipality to overcome the problem. Their role is essential in the 3 'R's, i.e., reduce, reuse and recycle the solid waste. Public need education and awareness programme again and again about this three 'Rs' of waste management.
5. There can't be a universal method of solid waste management. Community need to be consulted while dealing with specific issues of the locality.
6. For a successful implementation of any programme public involvement in large scale is needed. Solid waste management is one such programme. To improve the quality of life and their city, they need to involve themselves in such programmes. The Dayal Committee report (1995) says that public Information, Education and Communication programmes must ensure that, people become aware of the problems and programmes of the authorities.
7. The local body must identify the areas where public should participate in solid waste management. They need to be educated on problems of throwing waste on the streets, drains, open spaces, water bodies etc. Awareness programme is needed on storage of organic / biodegradable and recyclable waste separately at source.
8. Retail outlets, manufactures and producers can give concession or discount to the people who return the packaging or bottling materials which can be reused.
9. Manufacturers of varieties of domestic or non domestic products, food products or non food products need to be persuaded to use reusable packaging material, so that after the sale of goods packing materials can be collected back and used again and again.

10. In nationwide lot of efforts can be made to encourage R & D in managing disposable waste.
11. Educating and creating awareness at school levels about the need for waste management and cultivating the habit of usage of dust bins at public places is a need of the hour.
12. People must be educated irrespective of their socio-economic level, educational level about the scientific management of waste.