

Zero Waste Management System: Case Study- Kumbarakoppal, Mysore

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Abstract— Growing population is also increasing the generation of waste. Due to this increase, it is important to study and analyse treatment options for solid waste generated. Zero waste system is an effective system to reduce quantity of solid waste for final treatment / processing. Kumbarakoppal is rural village near to Mysore city. Local authorities have initiated the segregation and resale of waste with community participation in segregation of waste at source. The economics of zero waste system is balanced with income from resale of waste.

Keywords— Solid waste management (SWM), Kumbarakoppal, Economics.

I. INTRODUCTION

Kumbarakoppal is northern area of cleanest city Mysore as ward number 35. Present population is 20000. This area is grown in grid iron pattern with narrow roads. The solid waste management system of Kumbarakoppal is also called as “Zero Waste System”. This is placed in 1.5 acre land. As name indicate this system reduced amount waste up to 95%. The major quantity of waste is used for recycle and reuse.

Solid waste is generated at household and neighborhood levels, which contains both biodegradable and non-biodegradable. These wastes are to be collected, transported, processed and disposed properly. The then Member of Legislative Council (MLC) was promoted the concept of ward-parliament in the minds of the local residents. He convened city corporation officers and NGOs to initiate this system of door-to-door primary collection, segregation of waste as bio-degradable and no degradable waste at the resident’s door, transporting this waste using hand carts and tricycles and composting of solid waste at community level.

II. METHODOLOGY

A. Initiation:

The system of door-to-door collection was introduced in collaboration with Mysore City Corporation and a Nongovernmental organization The MLC, who resided this area, carried forward messages in the minds of local residents for solid waste management awareness drive. He participated in the streetwise awareness drives, later involved in weekly meetings. The MLC along with the local Corporation, RWAs officer bearers, Health/Deputy Health Officer, Engineer, Health Inspector of the area conducted the series of weekly meetings to accelerate the solid waste management drives. The people, who raised the problems in the operation of door-to-door collection system, were invited for weekly meetings and their doubts used to be cleared in the meeting.

B. Details of system:

The Federation of Mysore City Corporation Ward Parliament(R) is currently operating this solid waste management system. This federation is undertaken by Mysore City Corporation. This federation works for collection of waste, segregation of waste and selling of waste. President of this federation is MLC member Mr. D. Madhaigoda.

5 wards of Mysore of total population 20000 are being served in this solid waste management system. Daily average 2 tons of waste is collected and segregated at centralized plant.

The plant is located at outside of area served. The shade for segregation, composting bins, storage shade for segregated waste and parking area are located in area of 1.5 acres.

a. Collection of waste:

The two member team is going door to door for collection of solid waste through his assigned area. Collection work starts from 7 AM and continues up to 10 AM. Two plastic bins per house are given for separation of wet and dry waste at initial stage. About 75 % of waste is being segregated at initial stage.

Authorities of Federation of Mysore City Corporation:



Fig. 1 Authorities of zero waste system

b. Transportation of waste:

Transportation of bio degradable and non-bio degradable waste is done in single vehicles but with different compartments for each type of waste. Each vehicle is of average capacity 400 kg. with 60% filling ratio. Three vehicles are available for transportation of waste. Daily 3 rounds of each vehicle are required to cover all area and collect all waste. Collected waste is transported to segregation plant. And bio degradable waste is directly supplied to composting bins.

c. Segregation of waste:

About 75% of segregation is done at initial stage remaining waste is required to segregate at segregation plant. Here segregation is done in two stages. In first stage segregation of plastic, glass, soft plastic and bio degradable waste is done. In second stage segregation is done in sub parts of each material for marketing i.e. plastic with different colors and thickness. Segregation is done on daily basis and starts with arrival of vehicle on grave yard.

List of materials to be separated from waste-

1. Milk cover
2. Plastic bag
3. Tablet
4. Bulb
5. Oil packs
6. Glass pieces
7. Shoes
8. Black Plastic
9. White Plastic
10. Colored Plastic
11. Tooth paste
12. Cardboard
13. Waste Paper
14. Tins
15. Road waste
16. Beer bottles
17. Plastic bottles

Segregation of all material is done manually. Workers separate all types of materials by hand. 10 workers are required for segregation process. Segregation process requires 6 to 7 hrs.

From segregation process dry waste is stored in bind and packed for monthly storage whereas biodegradable waste is sent to composting bins.

d. Composting:

Segregated bio degradable waste is directly dumped in composting bins. The bin is of size 10' x 10' x 6'. Generally two months are required to fill one composting bin completely. After two months compost is selling to the farmers as fertilizer. The average price of one bin compost is around 2500 rupees.

e. Labour requirements:

There are 30 workers working on plant daily. Out of this for segregation 10 workers are required. For collection, 9 workers are required with 3 vehicles. For road sweeping 8 labours are required. As supervising person two supervisors are appointed one is as plant supervisor and another is as site supervisor. All workers are appointed with salary of 7500 per month. A 'Stree Shakti' is group of local ladies is formed. 12 workers are working in this group with monthly 1500 rupees

as a salary. This works for social awareness, daily report of waste collection and cooperation between workers and public.

III. FINANCIAL STATEMENT:

Sources of income:

1. From sell of organic waste- 3500 per two months.
2. Charges collected from houses- 250000
3. From sell of dry materials- 27300

Total income= 279000/-

Expenses:

1. Workers payment- 258000
2. Vehicle operation cost- 10000

Total = 268000

Net income = 279000-268000

Net income = 11000/-

Income and Expenditure:

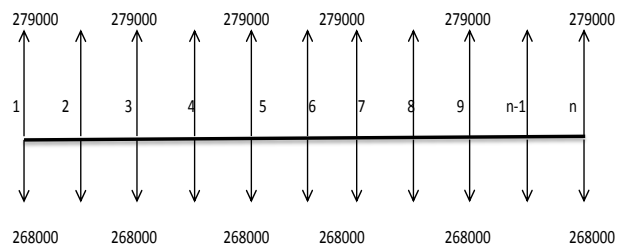


Fig. 1 Cash flow of expenditure and Income

Net income:

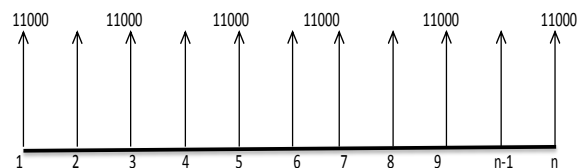


Fig.2. Cash flow of Net profit.

IV. CONCLUSION:

This system promotes local community to participate in solid waste management. After segregation quantity of waste is reduced as large amount of waste is used as compost and used for recycling of waste. Reuse of non-biodegradable waste and minimization in quantity of waste generation makes this system environment friendly.

95% of waste is being recycled in this system. Monthly earnings from waste recycle and reuse is 279000 rupees. The monthly expenditure on workers payment and operation & maintenance cost is 268000. Hence net profit from this solid waste management system is 11000 rupees per month. This is being utilized for providing facilities to workers like medical and educational requirements.

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