

Case Study

On

Dry Waste Management

Segregation at Source & Recycling

At

FORCE, Bandra

Forum of Recyclers' Communities and Environment

Under the guidance of

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Beginning of FORCE

Force was founded in October 2000 as a forum for recycler communities and to deal with environmental issues. It was started with the main aim of dealing with the immediate problems of solid waste management, for the reduction and recycling of dry garbage, for ensuring a better living condition for the rag pickers, and finally for the holistic community development.

Aid from MCGM

Its Bandra centre was opened in the year 2002, after MCGM provided them with the land to carry out dry waste segregation and basic processing. This centre has nearly 250 rag pickers that collect garbage from areas all over Bandra, Khar and Santacruz. These workers move around in the MCGM donated truck to collect garbage nearly three times a day.

Functioning

Role of Rag Pickers

The collected garbage is segregated at source (with the help of training imparted at various societies) and the rag pickers only bring back the dry waste.

They receive money for the material collected, depending on its type and quantity. For instance, Force buys paper from these rag pickers at a price of about 7 Rs/ kg, whereas it buys the PET bottles at a price of nearly 32 Rs/ kg. Other items of garbage purchased include, plastic bags, beer bottles, Perfume/Deodorant bottles at prices of Rs.2/kg, Rs.3/kg and Rs.5/kg respectively.

Thus on an average these **rag pickers have a regular income of about Rs.200 each day.**

Force not only helps these rag pickers to earn their daily bread, but also arranges for their annual health checkups and helps them obtain donations for severe medical treatments.

Work at FORCE site

Besides these 250 rag pickers working for FORCE, nearly 15 more work at their Bandra center.

They perform the job of separating the dry waste collected into different types. For example PET bottles will be separated out from other types of plastics and so on. The workers then subject the PET bottles to compression after discarding their caps. The machine in no time flattens these bottles completely and reduces their space requirement by a huge margin. Another machine is used to subject the compressed bottles by grinding. Thin flake like pieces of plastic emerge as the end product.

Both types- compressed bottles, and plastic flakes are sold to companies at prices around Rs.50/kg and Rs.40/kg respectively, depending upon their quality. These products are mainly sold to companies in

Khopoli, Maharashtra and Silvassa, Gujarat and are used for making decorative beads; cotton like fiber used in sofas, mattresses etc. and even plastic bottles again. The basic processing done at FORCE helps these companies to source a lot of plastic in one trip as it is compressed and shredded thereby occupying less space. Also these companies get segregated plastic which they need in bulk and ready for further processing.

The other dry waste like paper, metal and unwanted plastic is sold to agencies at Dharavi for additional income.

Outcome

Thus FORCE helps in collecting and processing nearly 800 - 1200 kg of waste material every day.

They have emerged successful in doing the same by organizing drives in various housing societies. These drives were aimed at educating people on how waste segregation can be effectively done at home itself.

Representatives from FORCE undertook the cumbersome task of approaching the secretaries of numerous societies to convince its residents to separate dry waste at source. If the residents did not cooperate initially, the representatives individually went to each household to convince the residents.

This segregation at source speeded their work and helped inculcate the value of environment protection in every house hold.

A small guide on how dry waste should be segregated is attached as appendix in the end.

Benefits:

Economic Benefits:

Cost Benefit Analysis of FORCE		
Raw Materials		
Weight of Plastic bottles/day in kg	1000	Collected by ragpickers from MCGM wards
Cost per kg (in Rs)	30	
Total cost per day (in Rs)	30,000	1000x30
Total cost per month (in Rs)	900000	30000 x 30
Total Cost per year(Rs)	10800000	9,00,000 x 12
Input Usable	90%	10% input is not usable
Total Input(Usable) in Kg/day	900	1000x90%
Other Expenses		
Salary per month per employee(Rs)	5500	
Total Number of Employees	15	
Total Expense in Wages (Rs)	82500	5500x15
Rent per month (Rs)	65000	for land

Electricity Bill Per month in (Rs)	15000	average as per bills
Total Other Expenses per month(Rs)	162500	82500+65000+15000
Expenses per Year(Rs)	1950000	162500 x 12
Transport		
Cost of Tempo(Rs)	700000	Useful life 10 years
Depreciation per Year(Rs)	70000	700000/10 using SLM method
Cost of fuel per month (Rs)	5000	Used for delivering output and collecting Input
Cost of fuel per year(Rs)	60000	5000x12
Maintenance cost per year (Rs)	5000	for tempo
Total Cost of Transport per Year(Rs)	140000	70000+5000+60000+5000
Machines And Maintenance		
Cost of machine for Crushing (Rs)	125000	Useful life 10 years
Depreciation cost per year(Rs)	12500	100000/10 using SLM method
Cost of machine for compressing (Rs)	350000	Useful life 10 years
Depreciation cost per year(Rs)	35000	70000/10 using SLM method
Total Depreciation cost per Year (Rs)	47500	10000+7000
Maintenance of crushing m/c per year	8000	oiling, replacement of blades
Maintenance of compressing m/c per yr	2000	oiling
Total Maintenance cost per year (Rs)	10000	8000+2000
Total Expenses Per Annum (Rs)	12947500	10800000+1950000+140000+17000+10000
Revenue		
Output sold		
Input Crushed (kg/day)	450	900/2
Selling Price per kg (in Rs)	40	
Total Income per day from Crashing(Rs)	18000	450x40
Input compressed (kg/day)	450	900/2
Selling Price per kg (in Rs)	50	
Total Income from Compressing/day(Rs)	22500	450x50
Total Income per day(Rs)	40500	18000+22500
Total Income per month(Rs)	1215000	40500x30
Total Income per Year(Rs)	14580000	1215000 x 12
Net Profit Per Annum(Rs)	1632500	14580000 - 12947500

Socio-Economic Benefits:



Snapshots at FORCE



Arrival of Dry waste for neighbouring localities



Paper waste after segregation



Plastic after segregation before processing



Segregation into different types of bottles



Shredding machine



Compression machine



Bundle of Shredded Plastic



Foam that can be produced from recycled plastic



Transport Truck at Force



I-card for Rag-picker



Bundles of compressed plastic



Tube after processing at factories, used to make bottles

Appendix: Segregation Guide

