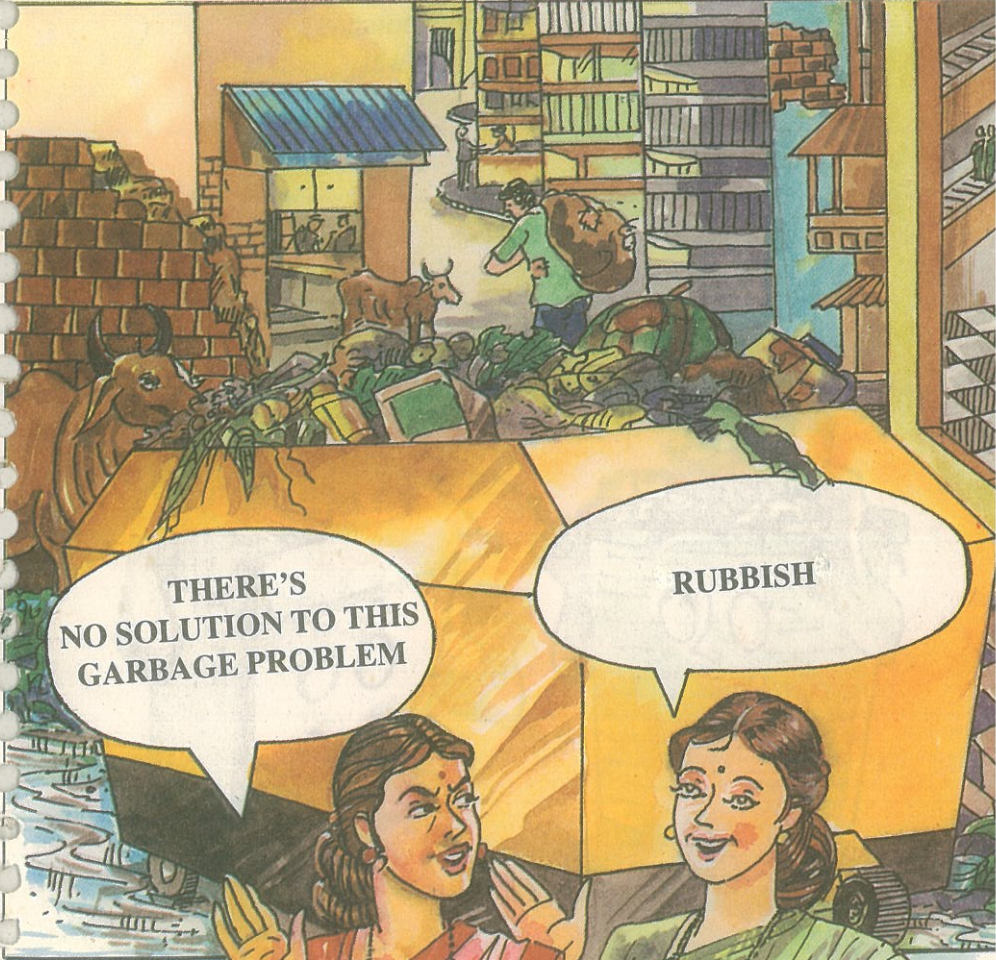




BOMBAY
first

KUTCHRA HATAO!



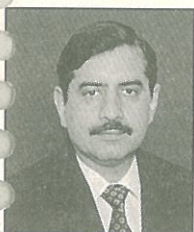
THERE'S
NO SOLUTION TO THIS
GARBAGE PROBLEM

RUBBISH

“There is a solution,
but it starts in your home,
by segregating the wet
from the dry waste”



FOREWORD



The Municipal Corporation of Greater Mumbai (MCGM) is entrusted with the responsibility of collection, transportation and disposal of approximately 6,000 metric tonnes of solid waste per day. Despite the efforts of about 35,000 conservancy staff and an expenditure of crores of rupees, the results are not commensurate.

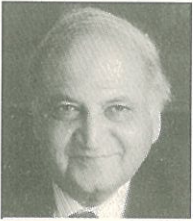
It has now been realised that the effort of the urban local body alone will not lead to a clean city and the involvement of non-governmental organisations is imperative. The approach of the MCGM is now to emphasise the reduction, recycling and re-use of solid waste. Segregation of garbage at source and *in situ* vermi-processing are the main planks of strategy for solid waste management. Organisations like Bombay First are helping the MCGM in reaching households.

The present publication is an important step in this direction. I hope that it will go a long way in improving communication between the urban local body and citizens.

A.K. Jain

Addl. Municipal Commissioner

Mumbai, April 1999



**From the desk of the Chairman,
Solid Waste Management Committee, Bombay First**

Paradoxically, it is our troubled present in Mumbai that sparks hope for the future. In solid waste management, for instance, the problems are evoking growing efforts at solution from citizens. This publication of Bombay First is meant to support that energy.

Bombay First is an initiative of the Bombay Chamber of Commerce and Industry. It aims to make this city a better place to live, work and invest in, which includes making it cleaner. A dirty city is an unhealthy city. This undermines everything else.

The municipality (MCGM) has made clear that no plan to improve city cleanliness and health can work without citizen involvement. Two year's work has shown us that citizen enthusiasm is not wanting. What may be lacking is information about what citizens should do and how, where to get advice and support and the best way for citizens to work with the MCGM.

The present publication is an attempt to fill that gap. It should be seen as a first try. It is meant for NGOs, residents' organisations, voluntary institutions and in fact everybody interested in a cleaner Mumbai and service of its householders.

Mumbai, May 1999

Keshub Mahindra

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Dignity Foundation; AYBI; the “H” West
Federation; the Save Bombay Committee

* Throughout this booklet the Municipal Corporation of Greater Mumbai will be referred to as the MCGM, not as the “BMC”

We have to tackle the problem NOW!

Mumbai generates over 6,000 tons of solid waste daily. Some 4,000 tons of it are produced in homes.

The Municipal Corporation of Greater Mumbai (MCGM) takes all of the waste to four dumpsites which, in just five years' time, will be able to take no more

To deal with the city's waste, the MCGM spends Rs. 300 crores every year and employs nearly 35,000 persons. Yet a recent survey of 40 Asian cities by *Asiaweek* ranks Mumbai last on measures which include hygiene and health, which in turn are inseparable from solid waste management.

Malaria, dengue, throat and lung troubles are at an all time high. Solid waste is a major contributory cause. It produces the gases and chemicals, the vermin and insects that cause ill health all over Mumbai. Three million citizens living in areas bordering the municipal dumpsites are the worst sufferers. Diseases we thought we had beaten like cholera are back.

Ours can be a cleaner, healthier city, but only if we do something about it ourselves, in partnership with the MCGM. We must:

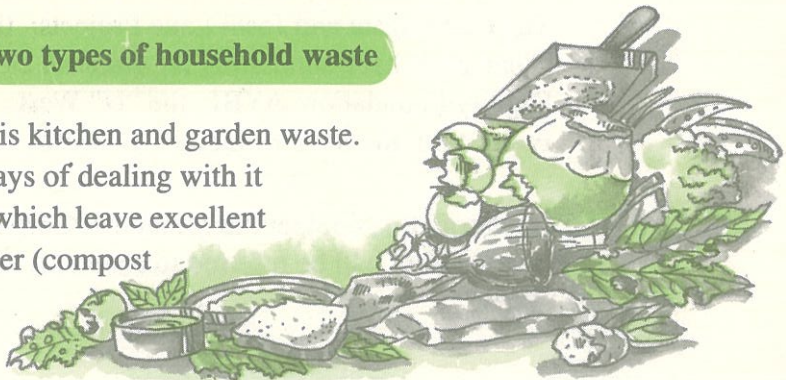
- reduce the waste we generate
- re-use goods, or buy re-usable goods
- re-cycle waste to new useful material
- refuse to use thin *jhabla* plastic bags.

It is not difficult. The solution starts at home.

There are two types of household waste

WET Waste is kitchen and garden waste.

Nature has ways of dealing with it hygienically which leave excellent soil conditioner (compost fertiliser).



DRY Waste is material like paper, plastic, cloth, metal, wood and glass which can be re-used or re-cycled profitably.



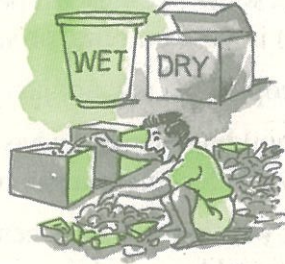
“Mixed” waste is bad for health

If the two types of waste get mixed, Nature’s good microbes in the wet waste cannot act. Their air supply is cut off by plastics and other dry waste. So decomposition gets left to the bad microbes in the waste. These generate bad smells, toxic gases, vermin and chemicals that affect health.



What to do? SEGREGATE!

1. Segregate the wet and dry waste, keep them *separate* in two different bins, or the wet waste in a bucket and the dry waste in a carton or bag.
2. As soon as possible after it is produced, hand wet waste to your *jamadar*. This will eventually go into the municipal system of disposal.
3. Dry waste, which collects slower, can be given to the *jamadar* every few days. Through him or her it will go into the city’s recycling network (eg via ragpickers).



How does segregation help?

1. Since wet and dry waste are not mixed up, there is no smell. You will find that kitchen waste breaks up faster.
2. Your *jamadar* (or person in charge of waste disposal) will be pleased to receive clean recyclable waste, ready for sale and will be encouraged to collect it regularly. It is worth money.
3. Ragpickers will not rummage in household or municipal bins and mess up the neighbourhood. Good for their health and yours.
4. There will be less wet waste for the municipal system to handle.
5. Dry waste is re-cycled. Waste becomes wealth.



How to get started

1. Collect some like-minded persons to act as a “Core Group” (see below) in your building or neighbourhood.
2. Get people who act, not just talk. Discuss these pages as a group.
3. Each building or society has its own problems. Tackle those getting most votes for importance in your building or area.
4. Check whether residents nearby, or elsewhere, are dealing with similar problems and if so how.
5. Discuss how to win over residents likely to oppose the idea and to encourage those who will cooperate.
6. Working with the MCGM is vital. Inform your Ward Office as early as possible of your plans.



The Core Group

The Core Group will be responsible for managing all aspects of the scheme. There should be regular meetings with an agenda, duties should be distributed and minutes kept.

1. Its members should take responsibility for specific floors in a building, or sectors of a colony, and for personal contact.
2. They should be able to handle householders' questions and difficulties. Each family should be given a copy of this booklet.
3. After the first meeting, Core Group members should keep in touch with residents joining the scheme. Results must be watched day to day for about three months.
4. The Core Group should hold periodic progress meetings with residents.
5. At some point, the Core Group will have to start a drive for funds to cover costs. Agreed contributions for six or twelve months at a time can be collected from building occupants or society members.

Meeting the "managing committee"

1. There is usually a decision-making committee or group in a building or neighbourhood. Draft a letter to the head of it highlighting:
 - current neighbourhood problems
 - their effects on health and environment
 - the benefits of your scheme (environmental hygiene, family health income for domestic staff and rag-pickers)
 - how easy the scheme is to implement
 - how ragpickers can become useful partners at no cost to the building or locality
 - the fact that waste segregation is a growing practice in Mumbai and the MCGM is all for it.
2. The letter should go to the head of the committee and be discussed at the earliest possible meeting.
3. At this meeting, Core Group members



should explain the benefits of the scheme for residents, the *jamadar*, the whole area and ragpickers.

4. Have the “managing committee” send a circular to all residents, asking for co-operation.
5. Residents may need to be spoken to individually. Multi-storeyed buildings have successfully utilised the services of “floor managers.”
6. Ideally, the building could make a rule that unseparated waste will not be picked up.

Meeting the *jamadar*

1. The cooperation of the *jamadar*, or person dealing with the building’s household waste, is vital. He/she must be met by a few Core Group members.
2. Demonstrate what is dry and wet waste.
3. Explain that the scheme can increase income for him or her.
4. Help the *jamadar* to identify ragpickers to assist in the work.
5. Offer to adapt building/society systems if necessary, stress his or her importance in keeping the locality clean and healthy.

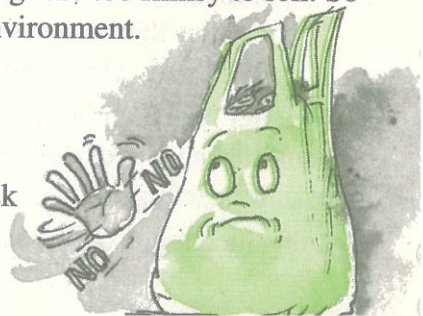


Say “No!” to Flimsy Plastic Bags

About five million new plastic bags (*jhabla* bags) are said to be put in circulation every day in Mumbai. Nature cannot deal with this material and the ragpicker does not pick it up - the bags are too flimsy to sell. So they deface the landscape and pollute the environment.

Therefore:

- * Use paper, cloth or jute bags when you go to market.
- * Say “No!” to plastic bags in shops and ask household staff to do the same.



* Educate all in the household, specially children, on the dangers of plastic bags.

* Never use plastic bags for handing waste to the municipal system.

The Union and Maharashtra state governments have initiated a move to ban the use of thin plastic bags. Many alternatives are available eg *ECO-BAG*, which is washable, virtually indestructible and folds into your hand (call Ms Aaliya Futehally Tel 610.5282). A sturdy and practical product is sold by Mr Pramod Khosla (fax 617.5119).

Ragpickers

The role of ragpickers should be recognised by including them in projects like these. Apart from gaining a sense of social usefulness, ragpickers will increase income, while householders gain a service.

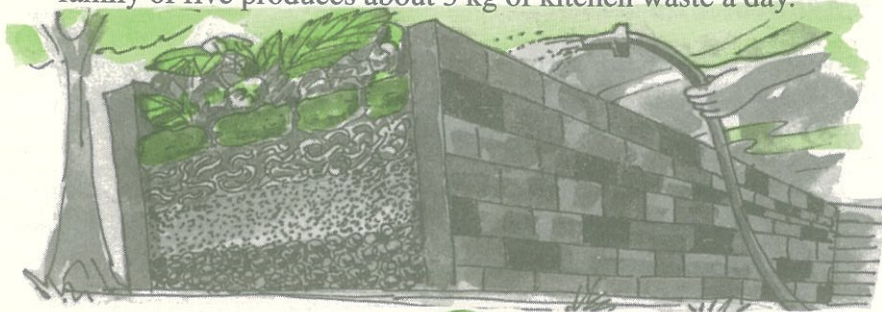
Turning kitchen waste into wealth:

Vermi-processing

What about wet waste? It can of course go to the municipal dumpsites. But it can become profitable soil conditioner through “vermi-processing.” Tiny micro-organisms and earthworms work together in Nature’s own partnership to convert waste into soil enrichment for growing vegetables, fruit or flowers.

To avoid errors, instructions below should be used along with the advice of experienced persons (see contacts listed below).

1. Select a soil surface away from direct sunlight in a building compound or garden.
2. One square metre will do to process 1 kg of kitchen or garden waste daily. This can gradually be increased to 2 kg or 3 kg every day. A family of five produces about 3 kg of kitchen waste a day.



3. Spread 3 kg or 4 kg of cowdung per square metre. Cover this with a layer of leaf litter about 10 cm thick. Cover that with a jute bag and maintain it moist for about 15 days. Earthworms will be attracted to the site. They “turn over” the soil and the waste. Microbes in the waste convert it into quality compost.
4. After 15 days, start spreading raw vegetable waste on the prepared bed and, after a month, spread cooked food waste, but not daily to begin with. Layers should not be more than 5 cm to 10 cm thick. Do not heap the waste. That cuts off oxygen at the bottom of the pile.
5. In places where there are no earthworms, vermi-processing can be done in a trench. Dig the soil to a depth of 1 metre. At the bottom lay bricks or pebbles. Spread cow dung over it (see 3. above).
6. Over that spread 4 kg or 5 kg of “vermi-casting” per sq metre of soil surface. This material is soil containing tiny earthworms. You can buy it from a number of sources.
7. The earthworms help change the wet waste over a period of time into fertile soil conditioner (compost).
8. To help prevent odours, sprinkle some dust/lime powder over the wet waste. Sprinkle water regularly to keep it all moist.
9. In about three or four months, top quality organic compost will form. Before harvesting, stop watering for a couple of days.
10. Use the compost to grow vegetables, fruits or flowers in the garden or in pots.

For details and help on vermi-casting and vermi-processing, please contact Ms. Priya Salvi - Tel: 500.3114/2004 or Mr. Srikrishna Bhagwat - Tel: (911) 483.238, 481.221; Mobile: 982.11.31124 or Mr. Anil Bhatia, Tel: 208.3811; Fax 206.2135.

Bio-chemical Powder

The powder is made up of soil and some vermi-casting. It digests wet waste to a dry powder so efficiently, a plastic pail can hold kitchen waste generated over 10 years by a family of five.

1. Take a plastic bin of 70 litre capacity. Burn a hole 2 cm in diameter in the bottom and several small 1 cm holes in the bin's lid. Or use a large earthen flower pot with a hole in the bottom.

2. Put a 5 cm layer of small stones or pebbles on the bottom. Cover with 5 cm of earth or beach sand. Moisten. Bin is ready for use.
3. Feed in chopped up kitchen waste daily. Sprinkle a fine layer of Bio-chemical Powder (BP) over it every time.
4. In the first 3 weeks, fill only raw, boiled or baked vegetables and fruit waste, rice and fried rice, cereals, dals, eggshell, dust, tea leaves and coffee powder. Shredded paper, cotton rags and *bhutta* residue may also be fed in, but preferably moistened.
5. In the first 3 weeks, avoid oily and non-veg waste, milk and milk products.
6. After one week, stir the waste in the bin to give it air, once or twice a day, while continuing to fill in waste.
7. After 3 weeks, you can fill in any type of wet waste but avoid coconuts. For larger volumes, sprinkle on more BP till the waste gets hidden from sight.

General : Keep bin in a shady place, the airier the better. If covering with a lid or gunny sacking, remove that at night. If you notice strong odour or insects, sprinkle a thicker layer of BP and stir. Do not put medicines into bin. Keep contents moist.

For BP supplies/advice: Mr. Norbert de Souza (Tel. 605.6608); Mr. Shantu Shenoy (Tel. 623.8467); Mr. Naresh Karmalkar (Tel. 640.3398); Mr. Ronnie Fernandes (Tel. 605.5280).

City Farming

This is a wonderfully cheap and easy way of growing fruits and vegetables on terraces and in compounds. All it needs is a steel bin, the "bagasse" left after juice has been squeezed out of sugarcane and wet kitchen waste. That's all.

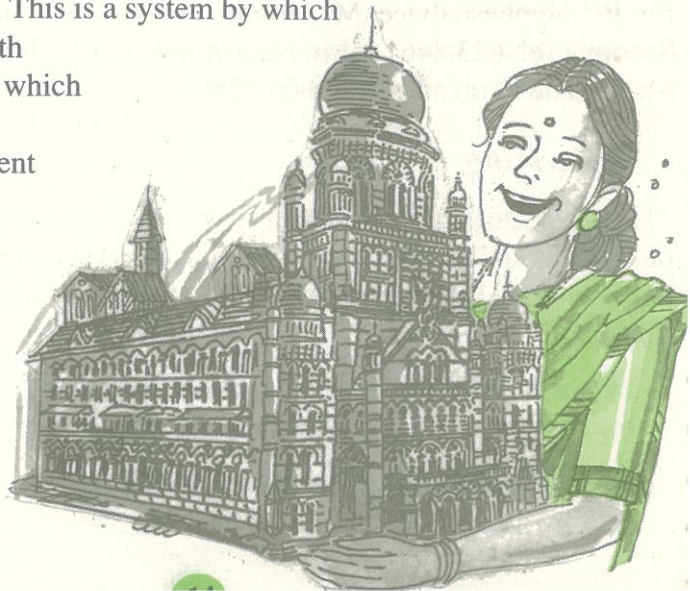
1. On the terrace, or in the compound, keep one 200 litre drum *per flat* for wet garbage. Cut 16 holes in the sides of each drum
2. Spread sugarcane bagasse along the bottom.

3. On that layer, spread the daily collection of wet garbage. Sprinkle water into each bin daily.
4. When garbage reaches the first level of holes, plant a sapling of the fruit, flower or vegetable of your choice through each hole (see picture).
5. Spread one more layer of bagasse.
6. Continue layering garbage. At every hole level spread a layer of bagasse.
7. Some 16 saplings can be planted in a single drum. When full, start another drum. A single 200 litre drum can take the wet waste of a family of five accumulated over 8 months. For advice and help in City Farming: Dr. Ramesh Doshi (Tel: 640.1439)



“ALM” – A Framework For MCGM-Citizen Partnership

The MCGM is clear that in cleaning up Mumbai citizen involvement is essential. As a framework for this, it has set up Advanced Locality Management (ALM). This is a system by which the MCGM works with groups of households which accept the following solid waste management principles.



Citizens organise themselves in localities to identify problems, then work with the MCGM on solutions. Each Ward Officer appoints a cell, with a Nodal Officer (NO) in charge, to work with locality groups in waste management matters.

The sectors covered by ALM are waste management, vermi-processing, drainage, water, beautification, hawkers and encroachment, digging/filling/levelling/surfacing of roads, wandering animals, pest control, vagrants and traffic. The NO is a locality's "single window" to access all MCGM functions in the ward.

The Locality

An ALM "locality" usually comprises 15 to 20 buildings (about 1,000 residents) on a single street. Residents form a Locality Committee (LC), with representatives of every building, and inform the Ward office of its formation. The LC meets once a month and appoints 2 to 4 office bearers to interact with the MCGM.

- * Households maintain separate bags/bins for the two types of waste.
- * Each family stores dry waste in thicker "high density" plastic bags which go, or are emptied, into the building bin once a week. Recyclable waste is the building's responsibility. It goes, via *jamadars* and ragpickers, into the city's re-cycling network. (Dry waste will soon not be lifted by the MCGM).
- * Participating buildings make every effort to turn kitchen garbage into soil conditioner. The necessary pits or beds are set up on available land, or bins are maintained for city farming.
- * Debris/rubble should be handed over to the MCGM by the households generating it. They will be liable to pay the municipal charges.



- * LCs should consider beautification of the area to improve the neighbourhood's quality of life.
- * The seed at the heart of ALM is co-operation. It is recommended that a participating building should collect between 50 paise and Rs 5 per apartment per day to create working funds.

The Ward Office

All Ward Offices have copies of ALM.

- * The NO visits each participating locality once a week after fixing a convenient appointment with an LC.
- * The Ward Office keeps a Locality Register of LC complaints.
- * The NO interacts with departments in the Ward office and MCGM and issues necessary instructions for work. On every visit to a locality, progress since the last visit is reviewed and registered. Once a month, the Ward Officer reviews the register and issues instructions



- * The NO will also register complaints against a building or locality. If requests for correction are not respected, the Ward may take action, with the LC's support.
- * Locality committees will be informed of repairs and other civil work being undertaken by residents in the locality.
- * The NO will try to ensure better co-ordination among the MTNL, BEST and MCGM in street and pavement digging.

Bins, landscaping, banners ...

The Ward Office will allow bins to be fitted to every light pole, promote landscaping and provide water and electricity for the purpose, provide a banner on both sides of a lane to announce the locality is an ALM participant and display the telephone number of the responsible NO, set up an information cell on ALM; if contacted by a sufficient number of citizens, run training sessions on ALM; organize publicity to mobilise citizen support.



What LCs could do — suggestions

A Locality Committee (LC) should tour the area every month, or six weeks to note:

- i) Garbage - is it being systematically collected from homes?
- ii) *Safai karmacharis* - are they working well?
- iii) Rubble and debris - regularly removed?
- iv) Pavements and road surfaces - in good condition?
- v) Road digging - proper display of contractor's name and tel no, dates of start and scheduled finish of work?
- vi) Household segregation of garbage - what progress?
- vii) Street dustbins - in place, in the right number?
- viii) Second cleaning (if applicable) - is it being properly done?
- ix) Drainage - are streets draining water, are sewage and water pipes working well?
- x) Vermi-processing of wet waste - who is doing it? How well?
- xi) Ragpickers - anybody involving them? In what way?
- xii) Encroachment on pavements/streets (illegal construction, hawkers)
- xiii) Buildings - their condition? Illegal structural alterations?
- xiv) Slums - water supply and sanitation? Encroachment?

For further information on ALM, contact Mr. Srikrishna Bhagwat,
Tel: (911) 483.238/481.221. Mobile: 982.11.31124.

Some typical worries addressed



Core Group and LC members must be prepared to handle questions and doubts. Here are some typical ones, with sample answers.

Q: Do I have to buy a second bin?

A: No. Dry waste can be collected in a carton or cloth/plastic bag hung behind a door. Use any method your own creativity suggests.

Q: Is it a lot of extra work?

A: No. It is commonsense and something logical for your neighbourhood.

Q: What if the jamadar mixes it up?

A: He will not - if he has been spoken to properly and told about the significance and benefits to him.

Q: Will the dry waste attract rodents?

A: Not as long as it is kept free of eatables and kitchen wastes..

Q: What about sanitary waste?

A: Sanitary waste should only be discarded in paper bags, never in plastic. But if that is not possible, dispose of it along with the wet waste, enclosed in a paper wrapper.

Q: What if my neighbours do not segregate?

A: The project is effective even if one family segregates “wet” from “dry”. Don’t wait for neighbours. Set an example yourself. (A success rate of 100% at once is unlikely. If 70% residents are segregating, that’s excellent).

Q: What should I say to them?

A: Make persistent efforts to explain to neighbours that their duty and their benefit coincide when they segregate wastes generated at home. Help them understand their difficulties in segregating waste and suggest solutions.

Q: What if my maids and domestics do not follow the system?

A: We must convince them. They do our bidding in other things. But first, we must be convinced ourselves.

AYBI (Association of Youth for a Better India) is a non-profit, non-partisan liberal youth organisation. AYBI's national convention in 1998 focussed on *Partnerships for a Better India* (Government, business and the NGOs).

A key project is waste management. Initiated in 1991, AYBI has created awareness on segregation at source. Regular presentations are made to building societies and citizen groups. More than 300 school children have been trained who have gone door to door to over 5,000 houses.

Dignity Foundation provides senior citizens life enrichment services.

A prominent activity of the foundation has been mobilising members to supervise the city's clean up services. There are now over 600 such volunteers. "Model Streets" (150 of them by March 1999) and "Garbage Yatra" are innovative and successful aspects of "Cleaning Mumbai with Dignity."

Excel Industries have been many years in waste treatment and management.

They have developed a free flowing powder free of live organisms, made up of bio-enzymes and herbal extracts. It rids wet waste of smell and speeds up breakdown into compost. (Contact - Dr S.R. Maley, Fax 678.3657).

The Bhawalkar Earthworm Research Institute, Pune (Contact -

Ms Vidula Bhawalkar and Mr Uday Bhawalkar Fax 0212.442305)

Praja (Tel: 218.8865; Fax: 218.5739) is an organisation concerned with

citizen participation in governance. They have created and produced a "Citizens' Charter" detailing the role and duties of MCGM departments.

Most importantly, it indicates what citizens should do and who they should contact (by designation, with addresses and telephone numbers) in case of problems and complaints.

Bombay First (Fax 492.5039) established its Solid Waste Management

Committee in 1996. Programmes include the Churchgate Project (see above), now extending to all of "A" Ward and parts of "D" Ward and the western suburbs, organisation of workshops and safe management of hospital waste.

Mr. Viren Merchant (Tel. 513 1293), of *Svavalambi*, a project in Joshi Lane, Ghatkopar says, "This place was awful, with its garbage and litter. It was well-known as *kachragalli*! We started with waste segregation in our homes. Then vermi-processing. Today, we are a kind of showplace, with 700 plants on our street. Also we have pioneered ALM here." Says this chartered accountant, "We fund ourselves. We collect Re.1 per flat per day and our work leaves nothing for MCGM staff to clear!"

Ms. Neena Sawhney, a resident of South Mumbai, got the housewives in her society to join her in a vermi-processing project. The soil conditioner it produced was used not just in the building's garden but in homes, for potted plants. Near-by buildings have taken up the idea. Says Ms. Sawhney, "Vermi-processing is best where volume of waste is small."

Dr. Ramesh Doshi (Tel 640.1439) After retirement, he got interested in organic farming and started producing compost for a terrace garden. Today he is into City Farming. The results are startling. Fruit saplings that normally yield fruit in 5 to 7 years, do so in two.

Mr. Norbert De Souza (Tel. 605-6608) has been in grassroots work tackling garbage since 1994. He works with the "Bio-Chemical Powder" developed by the Bhawalkar Institute, Pune.

Mr. Anil Bhatia (Tel. 281-1941) leads the vermi-processing action on "D" Road, a part of the Churchgate project. Twelve buildings are now participating. Mr. Bhatia believes that involving the children has made a key difference. Over a year, the 95 baskets of garbage removed daily by the MCGM from "D" Road are down to just 20 baskets.

The Save Bombay Committee, under Mr. Kisan Mehta (Fax 415.5536, Tel. 414.9688) has pioneered awareness of, and action in, the problem of solid waste management. The SBC has developed the Integrated Solid Management Programme and works closely with many citizen groups and the MCGM. The programme is being widely accepted.

Federation of "H" West Ward Citizens' Associations was formed in 1992 to forge individual associations into a united front vis-à-vis civic problems. Working with the Dignity Foundation and other active citizens, the Federation has helped form 43 locality and street committees in the Ward.

It can be done, it is being done

Numerous residents' associations, NGOs and private citizens are successfully involved in segregating waste at source, vermi-processing and recycling. Several projects are under way with lessons to share.

“Clean-Up Churchgate”

(contact – Ms Nayana Kathpalia Fax 282.3877).

Churchgate is a pilot area.

Here, 1.5 million commuters transit twice a day. A major success is the growing partnership in the



project group: the Clean Mumbai Foundation, the Marine Drive Citizens' Association, the M. Karve Road Residents' Association, the Nariman Point Churchgate Citizens' Association and the Oval Cooperage Residents' Association, with start-up funds from Bombay First. Project lessons include a second cleaning of the area in partnership with the MCGM. Two workshops have been held on home segregation. The system is catching on well. Successful vermi-processing is under way. The Citizen's Forum for Protection of Public Spaces, an offshoot, is helping to regulate hawkers in Mumbai. Street digging activities of MTNL, the BEST and the MCGM are being rationalised. Churchgate-based business is contributing funds.

The Clean Mumbai

Foundation (Chairperson - Ms Kunti Oza Tel. 204.4838) is dedicated to improving quality of life in the city. CMF has in five years undertaken a dozen cleaning, beautification and



environment projects with the MCGM and other institutions. CMF has enjoyed the support of several prestigious donors and corporations. It is working closely with Bombay First and has initiated clean-up activities all over the city.

This booklet has been published by Bombay First, Vazirani Villa, Scheme 42,
Worli Sea Face, Mumbai - 400 018. (Tel: 497-5394/497-5395 or Fax: 492-
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