CAN IITB BE A **ZERO WASTE** CAMPUS?

a book on household solid waste management in IITB

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IDC
Industrial Design Centre,
IIT Bombay Project

Acknowledgements

Aai

Kaka

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Kalyani

Daily Dump

Shishir for the InstiMap

Thankyou for your love and encouragement!

Dedicated to the lovely campus of IITB


IITB
A ZERO WASTE CAMPUS

A STEP TO MAKE INDIA A 'SWACHH DESH'

IITB is a home to more than 6000 people today including students , professors and staff. Many experiments and projects are done in campus to maintain its cleanliness. IITB looks clean and beautiful and many outsiders aspire to live in a place like this. It has the potential to go zero waste but there is a long way to go.

A dream of Swachh Desh can come true only when many other campuses, societes, institutions, offices, residential areas in the country try and generate less waste and wish to go zero waste like IITB.

Powai Lake

“Cleanliness is not just the physical appearance, it is also about one's thoughts”

CONTENTS

Zero Waste does not literally mean
not throwing away anything at all.

1. What is Zero Waste?

“ Zero Waste means to consume less, generate less waste, repair and reuse things, recycle maximum and send almost no waste to the landfills ”

Our Goal

We the residents of IITB campus can recylce **95%** of our waste to become **Zero Waste.**

How ?

Reduce

Use less of something and dont waste it.

Reuse

Use items over and over again unless its unusable.

Recycle

Using materials from old items to make something new.

This is NOT a Zero Waste practice.

1 *Throwing all your waste mixed into one waste bin.*

2 *Disposing your household waste daily in a plastic bag.*

3 *Your waste being dumped on landfills.*

This IS a Zero Waste practice.

1 *Throwing your waste seperately into dry and wet waste bins.*

2 *Dry waste is sold & recycled to create new items.*

Paper Plastic Metal Glass

New Products

3 *Composting is the best way to recycle kitchen & garden waste.*

2. Daily Waste Generation

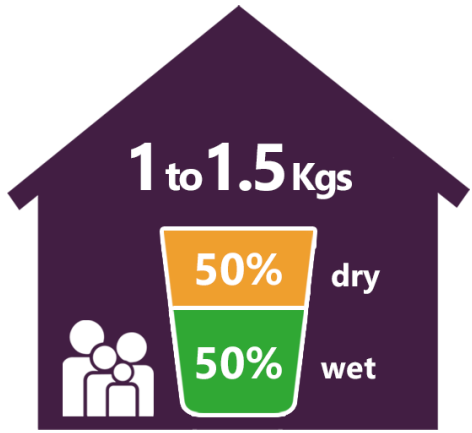
A little about India

Today in India amongst 468 cities, 3 cities have more than 1 crore population and there are 53 cities with more than 10 lakh population each. Everyday these cities generate around 1 lakh 31 thousand tons of waste. Mumbai, the one among the 3 cities, generates 54,43,108 Kgs waste daily which is 6.11% of the total waste generated daily in India. Central Board of Controlled Pollution proposed for regular collection of total waste from these cities, but only 87 thousand tons of waste is collected. Remaining amount of waste is not collected and is lying on the same place because of the improper system of waste collection. Municipal corporations will take this waste to the outskirts of the city for dumping. This place is called as landfill or open dumping ground. If this amount of waste daily goes to the landfill without any treatment then the landfills might need daily thousands of square meters more space for dumping. Other cities will soon start growing huge garbage mountains like Deonar landfill in Mumbai due to which these cities might have to face constant bad stink and diseases evolving from it.

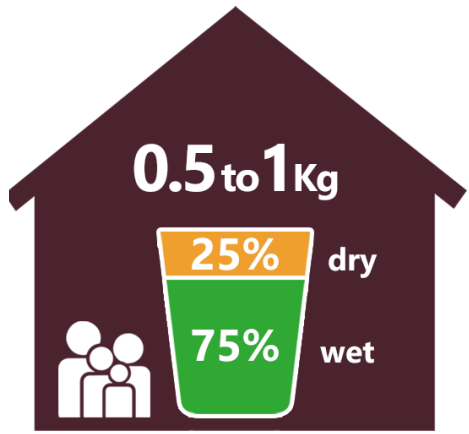
IITB Campus

Looking at IITB campus, it seems to be evolving day by day. As prosperity is rising, evidently, intake of things is growing and effectively waste is also growing. Increase in income, is diverting IITB people from cooking food at home and order food from outside which results in less generation of wet waste and increase in dry waste like plastic and aluminium. Changing lifestyles of middle class, upper middle class people in the campus is leading to day by day increase in their waste generation.

Daily Waste Generation in IITB Campus Households



Upper middle class family



Lower middle class family

Mumbai's Daily Waste

1.5 Kgs | 1.5 Kgs | 1.5 Kgs | 1.5 Kgs | 1.5 Kgs
1.5 Kgs | 1.5 Kgs | 1.5 Kgs | 1.5 Kgs | 1.5 Kgs

Household waste from
10 **urban middle** class families

=

One sack of rice

A truck of **60** such sacks

= **900 Kgs Waste**

Mumbai's Waste
54,43,108 Kgs

= **6048 Trucks**

Note : Rice Sack is taken as an analogy to illustrate the waste generated into number of trucks.

IITB Campus's Daily Waste

Out of **6048** trucks of Mumbai's waste IITB Campus generates total **6** trucks of waste daily.

IITB Campus's Waste

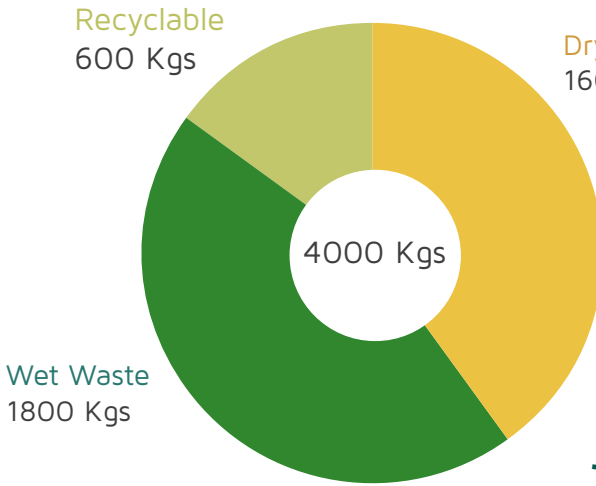
5,700 Kgs = **06 Trucks**

Within 3 months, there is a rise of 1700 Kgs of waste.

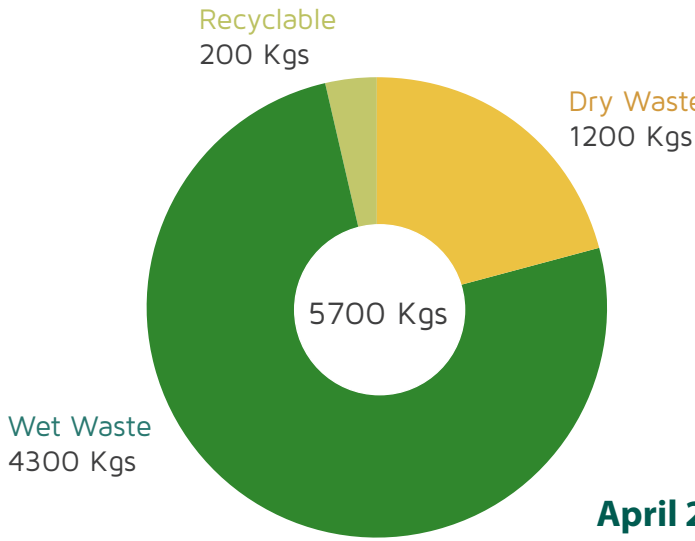
In January, average total daily waste was 4000 Kgs. In April, it increased to 5700 Kgs.

Drastic increase in wet waste and decrease in dry waste is due to incomplete segregation. When the activity of segregation began in January, first month gave decent results. But the activity did not last the way it began and hence is the rise in the total waste.

IITB Campus Waste Statistics



January 2015



April 2015

By 2030, we will need the equivalent of two earths and we have only one.

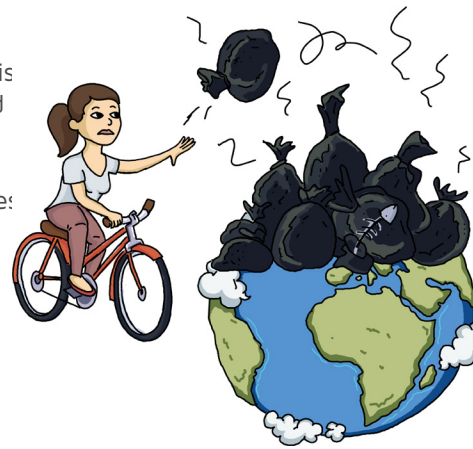
We are turning resources into waste faster than waste can be turned back into resources.

What are Landfills?

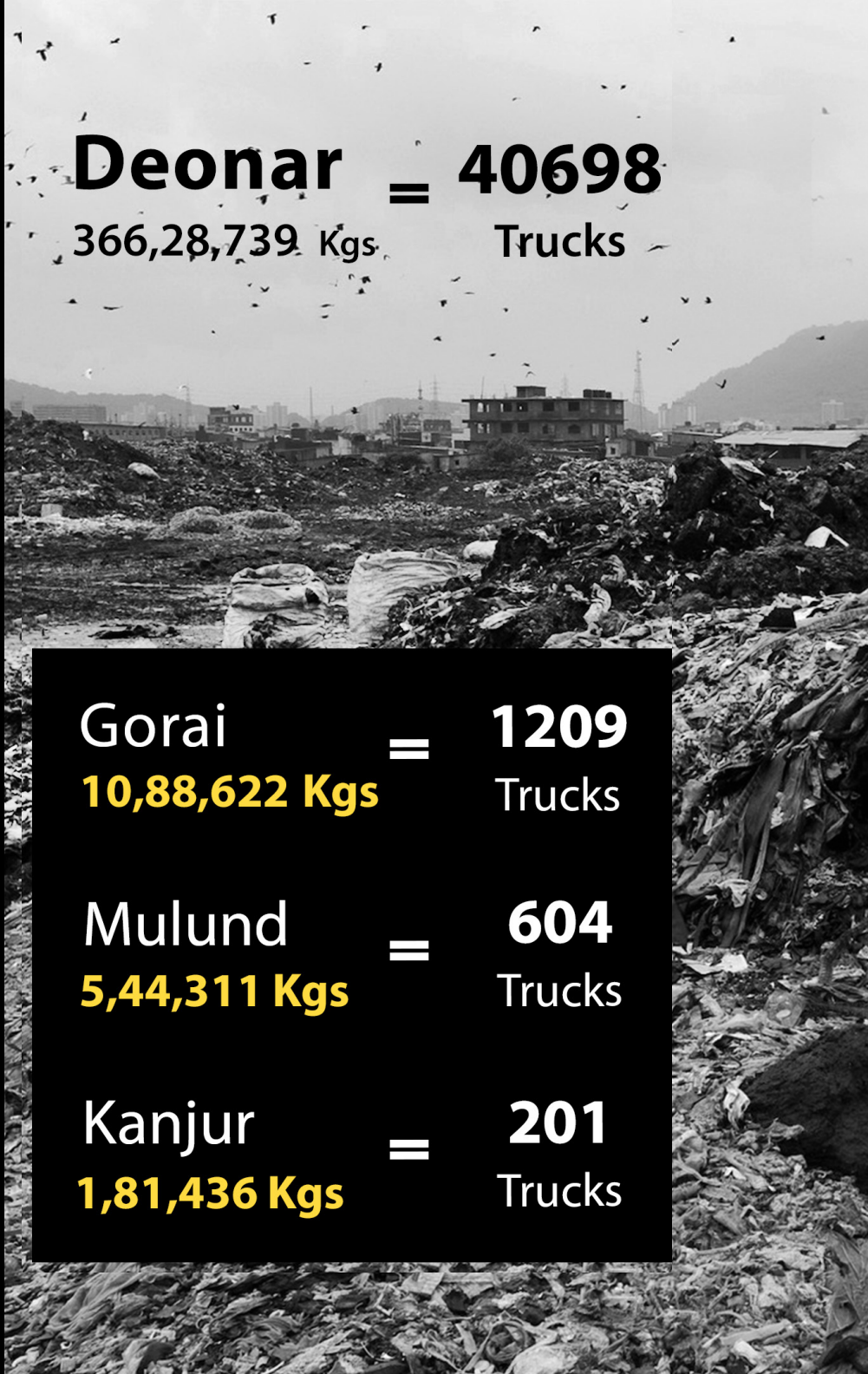
A landfill or dumping ground is a low-lying and marshy area, which is located on the outskirts of a city, where there is, usually, no human population. Majority of the Municipal Solid Waste collected in Mumbai is disposed off on open land. Irregular and incomplete waste collection and transportation in the city leaves MSW on the streets. The average life of a dumping ground is 30 years. The life left of city's largest dumping ground, Deonar, is only five to six years. Kanjur as an alternative site has been found for future waste disposal. The search for a new dumping ground started only when the filling area of Deonar seemed to be exhausting. Gorai landfill is soon going to be closed. It is difficult to aqcuire new land for dumping purpose.

Unsanitary landfilling pollutes ground and surface waters, emits green house gases and other organic aerosols and pollutes the air. Flies, mosquitoes and pests breed on the waste and unless properly maintained, the dumps are a public health hazard. In Mumbai, garbage is disposed along the railtracks also which is not accounted. Mumbai's 4 dumping grounds are located at Deonar, Kanjur, Mulund and Gorai.

In IITB, even though waste is seperated as dry and wet, eventually majority of it goes to landfill due to no treatment on it. It is either burnt or just dumped on open grounds. Plastic, aluminium, paper are majorly found. Plastic bags with 40 microns or less are easliy available and cheap which is used in bins to collect garbage.



Waste Dumped on Landfills. Per Day Numbers.



Deonar is the largest and the oldest dumping ground of Mumbai operating since 1927. Waste is being dumped without any treatment.

Gorai is operating since 1972, it is one of the smallest dumpsite of Mumbai. Presently, the closure of the Site is in process.

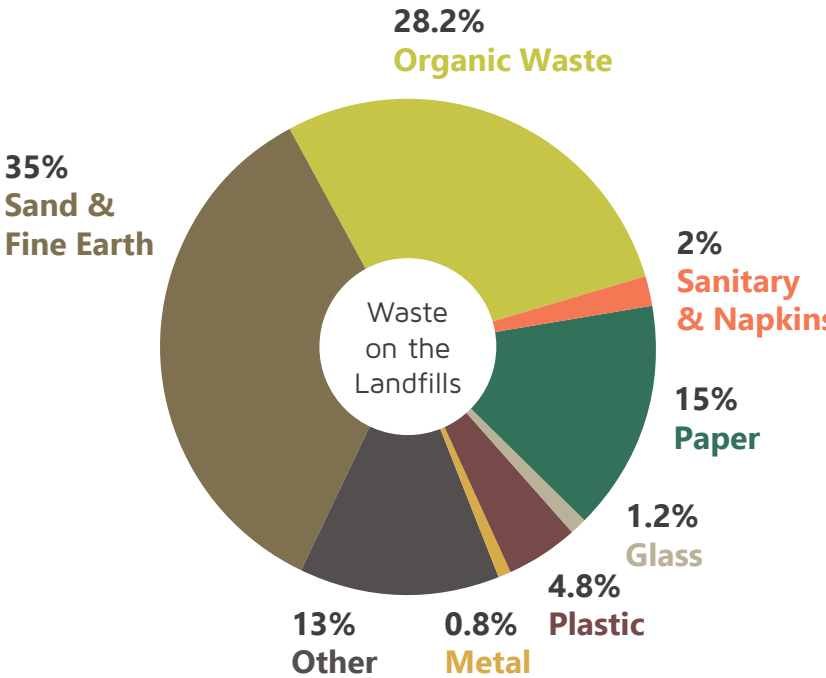
Mulund is the smallest dumpsite and operating since 1968.

Kanjur is a proposed site for MSW processing and disposal for future .

If we would recycle and reuse more, we would not dump so much on the landfills.

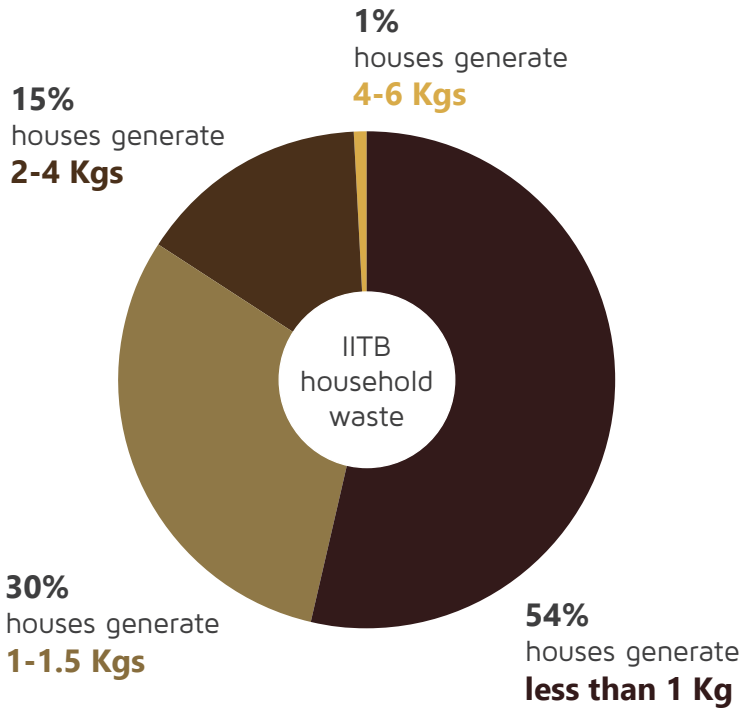
Though plastic composes of only **4.8%** of Mumbai's total waste on landfill, it causes maximum nuisance such as clogging of drains. Moreover, its combustion poses health hazards due to the release of toxic gases.
Paper can be recycled. Plastic, metal and glass are not bio degredable but can be recycled.

What's in the Mumbai landfills?

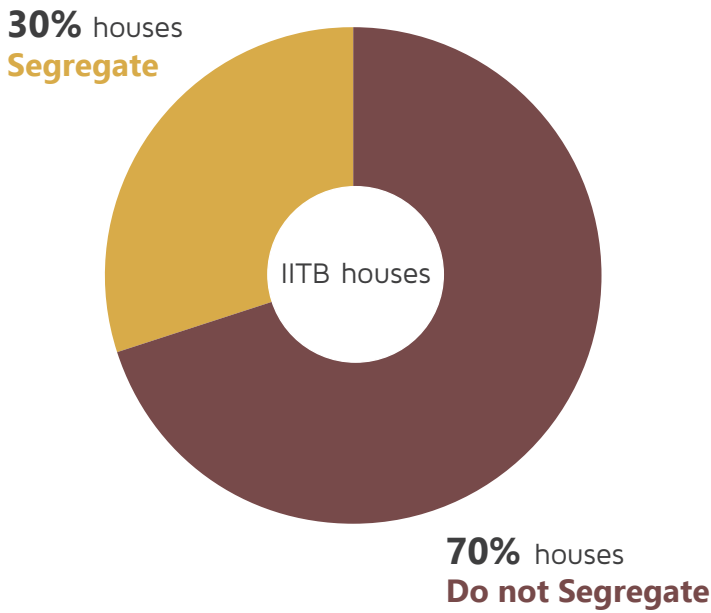


3. So much waste!

How much waste does your house generate per day?



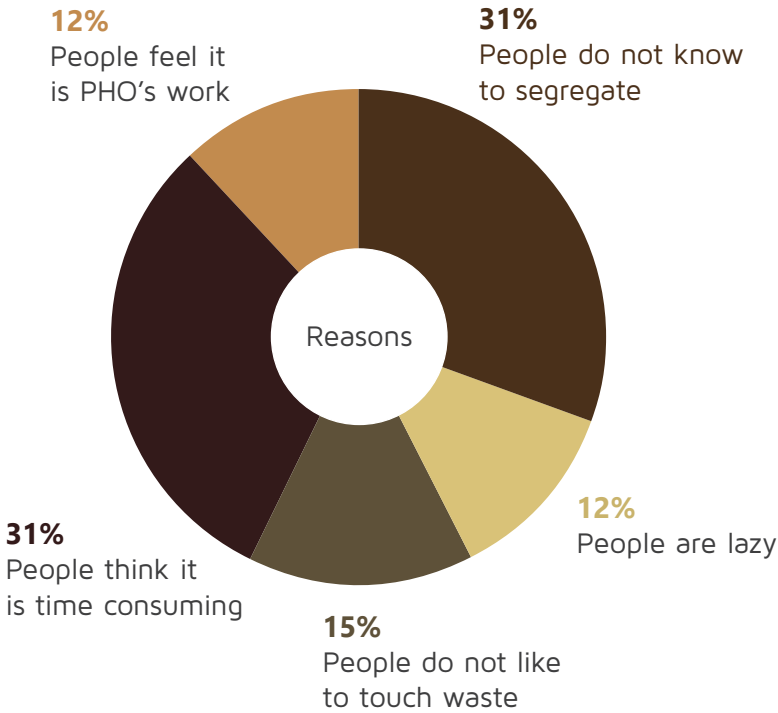
How many of us segregate waste at home?



Today, because most of us dont segregate at home, only 16% of the total amount of dry waste in IITB campus is recycled.

Rest 84% of dry waste is going to landfill.

Why 70% of us are not segregating waste?



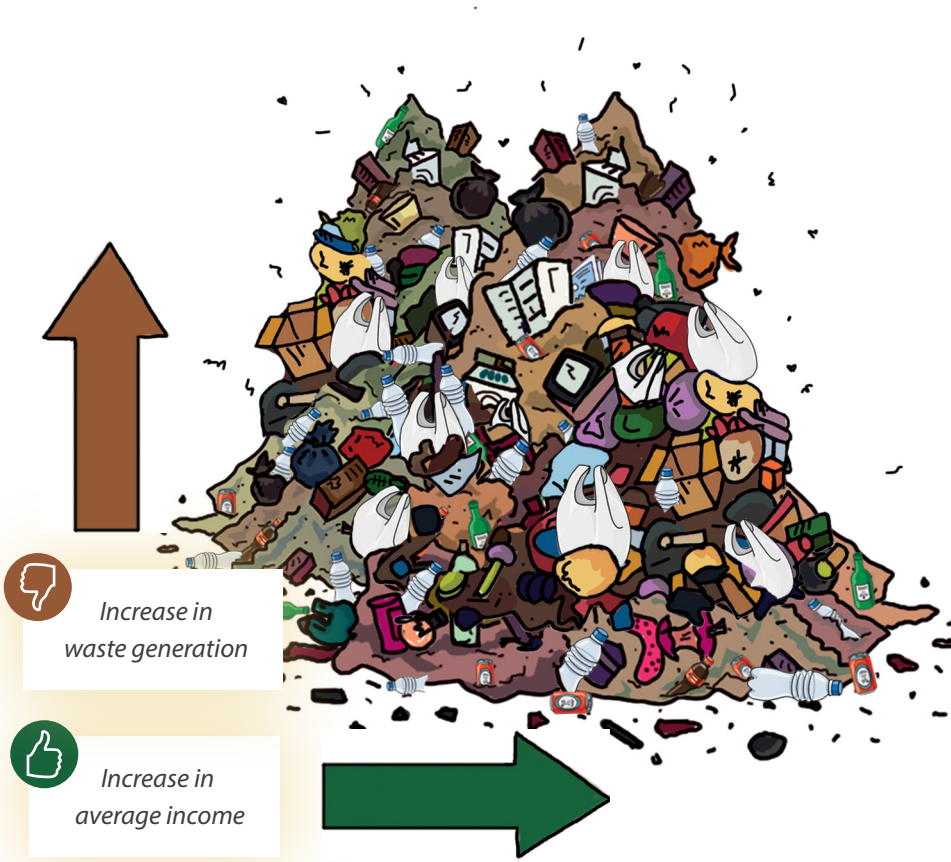
4. Lets Know Our Waste

To manage waste efficiently, one needs to know the types of waste.

Household Waste

The amount of waste generated in every home of IITB depends on the family's financial condition. In IITB families daily generate 500 grams of wet waste and half of it which is 250 grams of dry waste. If meals are prepared daily at home then the wet waste generation is typically more. Homes following a practice of ordering food from outside frequently generate more dry waste since the food is packed in aluminium foils, plastic bags and cardboard bowls for safe delivery purpose. More inflow of food than actually required leads to more wastage which is eventually thrown into bins. The scenario with the families earning less is vice versa. They efficiently use material to make food and make only in the required quantity. Hardly any dry waste is generated from such homes. Also, they try and use all parts of the vegetables and not waste anything. Looking at the two situations its evident families with more money consume more and less money consume less, though it might not be the case with all the families. Due to less space at their homes they cannot keep waste inside the house. And keeping it outside leads to Aswachhta attracting flies, ants, rats and dogs. Generation of household waste is typically categorized into two sections, they are **Dry Waste** and **Wet Waste.**

Income Vs Waste Generation



What goes in Dry Waste?

Paper

Bills, Statements, Envelopes, Cardboard, Paper Plates, Paper Bags, Wrappers, Tickets, Notebooks, Newspapers, Food boxes

Plastic

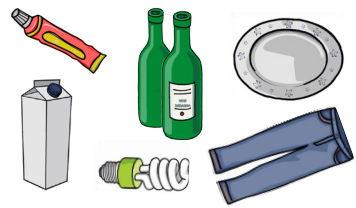
Cups, Plates, Bottles, Bags, Packaging, Bubble Wrap, Broken Toys, Takeaway Packs, Milk Sachets, Soap Packets, Electronic Parts, Stationary, Containers

Metal

Aluminium cans, Beer tins, Aerosol cans, Aluminium foil, Rusted Metal

Glass & Other

Broken glass, Glass Bottles, Tubes and Bulbs, Ointments, Old clothes, Rubber, Shoes, Thermacole plates and Parcel boxes, Tetrapaks

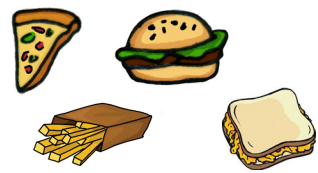


What goes in Wet Waste?

Fruits and Vegetables
Fruits and vegetable peels, Citrus fruits, Tamarind and Mango seeds, Corn cub, Sugar cane, Water melon, Stalks of cauliflower and Flowers

Bones and Shells
Washed bones of meat, Fish and Chicken, Crushed egg s shells, Coconut husk and shell

Cooked food
Left over food, Stale food, and rotten vegetables, Coffee powder, Tea bags , powder and leaves, Tamarind pulp



Garden Waste & Other
Sawdust, Hay, Barks, Dry leaves, Hair and nail clippings, Shredded old envelopes, Tissue paper and cloth, Human sweepings, Human hair and nail clippings

Other Solid Waste from the IITB Campus

Apart from household waste, total waste collected from IITB Campus by Municipal Corporation also includes construction waste, commercial waste, hospital waste, e-waste, street waste and other harmful waste.

1 Construction Waste

IITB campus being enhanced all the time either by renovations or new constructions this waste is created. This waste includes stones, rocks, leftover hard cement, broken pieces of bricks, iron pieces and rods, spoilt nuts and screws, wood, sawdust, broken windows and doors, paint, rollers and other material required for construction. Wood and metal is kept seperate, it becomes convinient and feasible to make reuse each of it. Debris at present are sent to landfills.

2 Commercial Waste

PHO vehicles collect dry & wet waste generated in

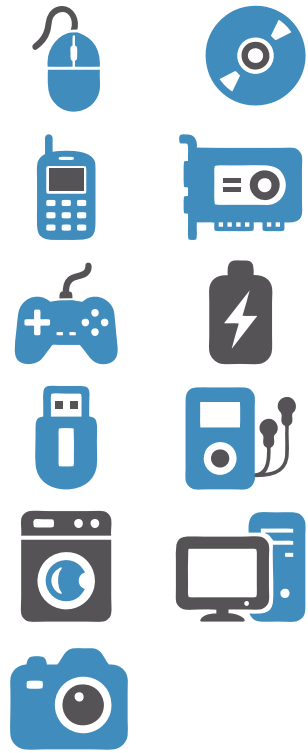
IIT shops and restaurants. Waste like plastic, paper, leftover food from the canteens is disposed in garbage bins. Cycle shops generate waste like oil cans and other chemicals.

3 Hospital Waste

Waste generated from IITB hospital includes expired medicines, syringes, soiled cotton, band aids and bandages, used clothes, unwanted cut human parts and organs. It can be poisonous, infectious and harmful to life, hence its disposal is properly taken care of. IITB follows the law of treatment of harmful waste strictly. An agency is hired to take away the harmful waste from the hospital and chemical department in IITB and treat it in a proper scientific way before its disposal. It is treated at Taloja, MIDC inceneration plant.

4 eWaste

IITB is a technology advanced institution in India. Here ewaste generation is obvious Technology is constantly evolving which leads to no longer production of the old devices, appliances and its lose bodyparts. Hence, repairing becomes a difficult and unpreferable job and devices have to be thrown. All this accumulates into ewaste. Easte is collected and sold off to an agency for recylcing. Ewaste includes both electrical and electronic waste which includes mobile phones, chargers, ovens, fridge, blender, geyser. All appliances running on electricity like battery cells, radio, transistors, music players, computers, laptops, tablets, wire cables, ink cartriedge, printers and their lose body parts. In last 15-20 years, generation of ewaste has increased tremendoulsy. VCRs and VCDs got replaced by CDs and DVDs. All old tapes,records are added up to ewaste.



5 Street Waste

Dust, waste from gutters blocking the pipelines, dry leaves, wrappers, coldrink cans form street waste. Recyclable, non recyclable and wet waste bins are installed across the campus. Waste from recyclabe goes for recycling. Non recyclable waste goes to the compactor and further to the landfill. Wet waste goes for composting. All unwanted material lying on the streets is street waste.

7 Harmful Waste

Many things around us are actually harmful to us like bottles of wall paints, oil cans from garages, acids for cleaning house, pesticides, thermometer, broken glass, broken bulbs and tubelights, blades, bleaching powder, cosmetics. Sharp things like needles, safety pins broken glass used blades are presently disposed by many in dry waste. During seperating recyclables from dry waste, cleaning workers get injuries.

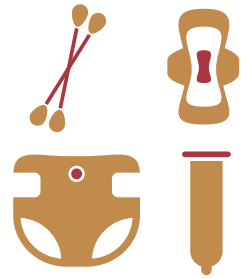
Though cleaning workers are are paid for their job, dont forget they are also human beings like us.

Do not mix your sanitary waste into dry and wet waste. Wash your pads and make a seperate paper bag for sanitary waste.

Keep sharp things into a seperate paper bag and inform cleaning workers while they collect it.

7 Sanitary Waste

This is another important element of waste which includes sanitary pads used for monthly periods by women and diapers used for old and sick people and babies. This waste is found in huge amounts on open dumping grounds. Typically, people in IITB practice wrapping their used pads and diapers in paper or plastic bags for disposal. But these bags are never opened by cleaning workers further and it lies in the same condition on open dumping grounds. When surveyed, we found out few IITB women wash their napkins then dispose. But these efforts are waste if some people mix their sanitary waste with dry and wet waste.It spoils other people's efforts of segregation. Cleaning workers hesitate to touch such mixed waste and it ends up either in wet waste bin or dry waste bin. The whole process of segregation is spoilt.



5. Who Keeps Our Campus Clean?

450 PHO Workers!

“Take a walk across the campus and you'll see 450 PHO workers cleaning the campus at a time”

Public Health Office
PHO takes care of the cleanliness for the complete IITB campus. It is a small office set up next to girls' hostel 11 opposite to the main ground.

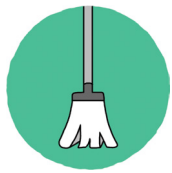
PHO Workers
PHO has hired workers from few contractors. Total 450 workers are hired from different agencies to keep the campus clean. They are paid on the basis of cleaning done square per meter area. They keep our camus clean!

How is their routine?

Daily workers gather at PHO in the morning to register their attendance, then only the proceed to their work. Every morning supervisor in PHO assigns them work. At the end of the day, supervisor gets updates from these workers about the status of the work. Also, throughout the day atleast once supervisor goes for inspection in every building and department in the campus. Workers have the option of working in any one of the two shifts, 7am to 4pm or 9am to 6pm. Only once a week off. If they bunk work, salary cut happens. Workers get paid monthly between 7th to 10th of the month. Change in wages (increase or decrease) might happen and is updated on the banners put in PHO.

They keep every corner of our campus clean everyday. And they do not have the luxury of paid leave.

PHO Activities



1 Housekeeping

Cleaning and maintenance of departments, hostels, main building, central library, schools, residential bildings. Terrace and surrounding area cleaning. All ATM areas.

2 Solid Waste Management

Collection and transportation of garbage from hostels, residential buildings, departments. Segregation of solid waste into recyclables and non recyclables. Composting wet waste. Biomethanization of wet waste.

3 Mosquito Control

Anti larval treatment. Fogging and spraying against adult mosquitoes across the campus.Regular checking of overhead water tanks. Anti malaria treatment.

4 Pest Control

Anti termite treatment. Sewage manhole treatment for cockroach control. Bad smell removal treatment.

5 Rodent Control

Regular rodent control treatment across the campus. Especially for departments, residential buildings, mess and food areas.

6 Stray Animals

Sterilization and vaccination of dogs. Disposal of dead animals and birds. Shelter for wild cattle.

7 Roads and Water Drains

Cleaning all main roads, footpaths and storm water drains. Clearing unwanted material from the campus.

8 Water Conservation

Running 'Soil Botechnology (SBT)' plant for treating waste water and reuse it for flushing and cleaning purpose.

9 Services for Institute Events

Convocation, Mood Indigo, Techfest, Lectures, Seminars, PAF, Examinations, Community Hall, Gulmohar Building/Lawn.

6. Present Solid Waste Management

Here are the significant methods of solid waste management being rigorously followed in our campus to send as less waste as possible to the landfills. The aim is to create an environmentally sustainable campus for future generations.

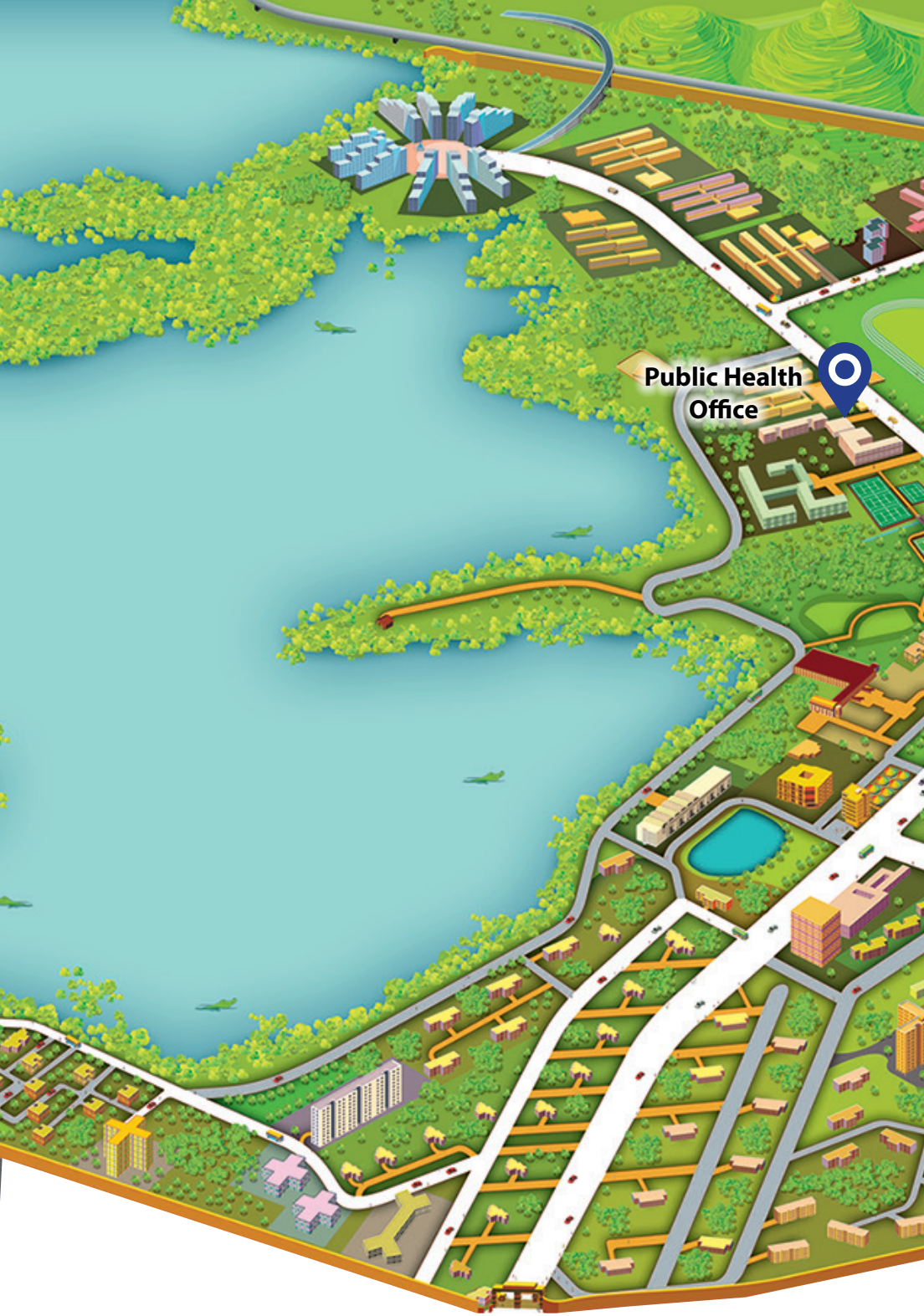
Vermicomposting
at Old Multi Storeyed building
Around 100 Kgs of Wet waste from the four high rise buildings - Ananta, Nilgiri, Sahyadri and Vidya Niwas and dry leaves from the campus go to this pit to be turned into usable manure. Vermiculture technology is designed by Mrs. Aparna Inamdar and enclosure is designed by Prof. B. K. Chakravarthy of Industrial Design Centre (IDC) department. It has been designed taking into account the convenience of the staff operating the facility, drainage and built using recyclable material. The facility will save fuel required to transport wet garbage, make manure available as a by-product and encourage people to segregate garbage into wet and dry.

Biogas Plant
behind Hostel 4
Food waste from all the hostels is converted into biogas fuel which serves 4 cylinders to hostel 3 mess.

K Yantra GreenHouse Lab
at Hillside next to Ananta
This centre is an initiative for urban farming experiments by Prof. Kavi Arya of Computer Science and Engineering (CSE) department. They make 'Amrut Mitti' a fertile compost from campus dry leaves and cowdung to grow organic vegetables.

Wet Waste Composting
at Industrial Design Centre
Daily 3 to 4 kgs wet waste from the two small IDC canteens go to the installed terracotta composter. Compost is ready in 45 days which is then added to the IDC plants.

Solid Waste Compactor
behind Girls' QIP building
Mixed solid waste from the campus is compressed in the compactor. More waste can be stored in the same available space for 2 days to save the number of truck trips.


Public Health
Office

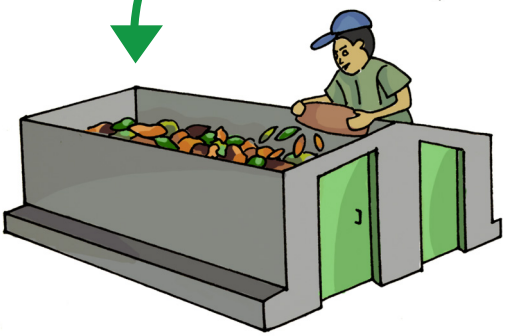
Solid Waste Management Practices at IITB Campus

Where does our household waste go?

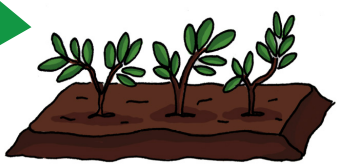
Family A
***Segregates** waste*

*Family B **does not***
Segregate waste

Garbage Collection



Composting wet waste



Compost added to the plants

Dry waste is daily weighed and recyclables like plastic, metal, dry paper are sorted out

Recyclables are sent to 'Stri Mukti Sangathana' for further fine segregation

Mixed waste which cannot be recycled goes into the Compactor

Mixed waste goes to the landfill

Cleanliness is NOT

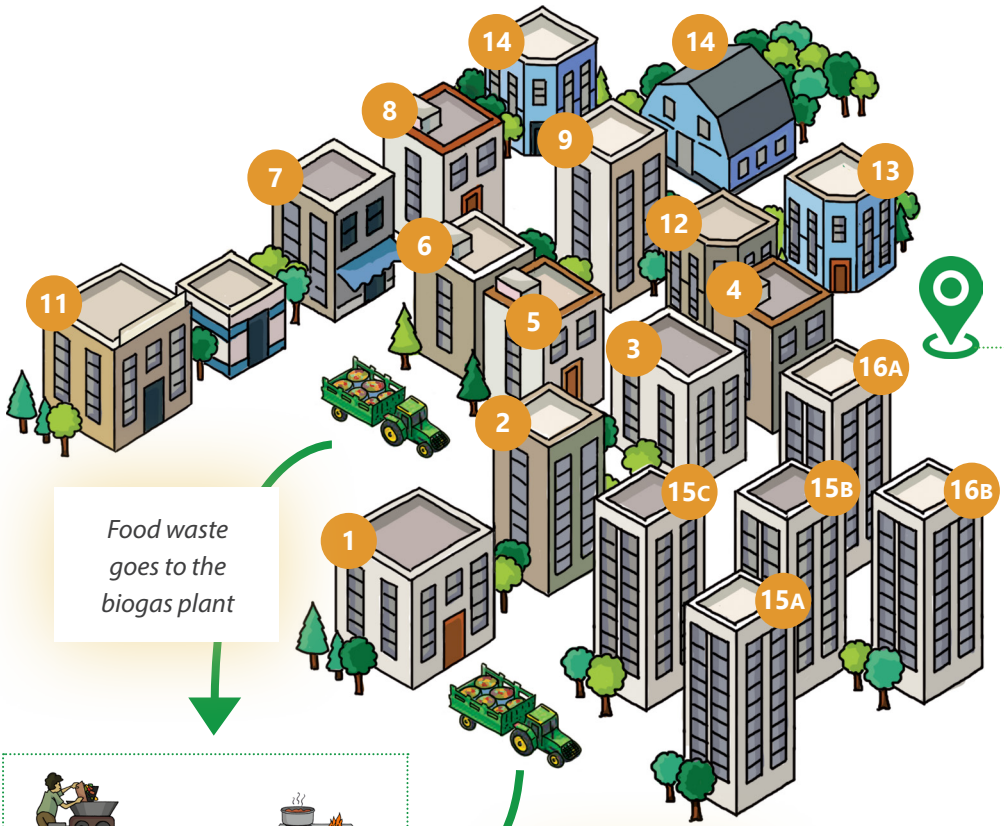
Collecting garbage from one place and disposing it to another.

Cleanliness IS

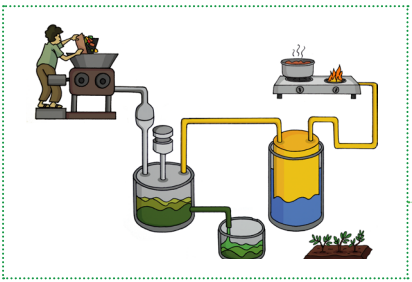
Managing our waste so that it does not need to be shifted from one place to another.

Our campus looks beautiful and clean!
But, are we really clean?

Where does the hostel waste go?



Food waste goes to the biogas plant



Biogas plant is located behind hostel 4

Daily, twice a day, two trucks go for collection of food waste from all 16 hostels. This food waste is taken to the biogas plant for generating fuel.

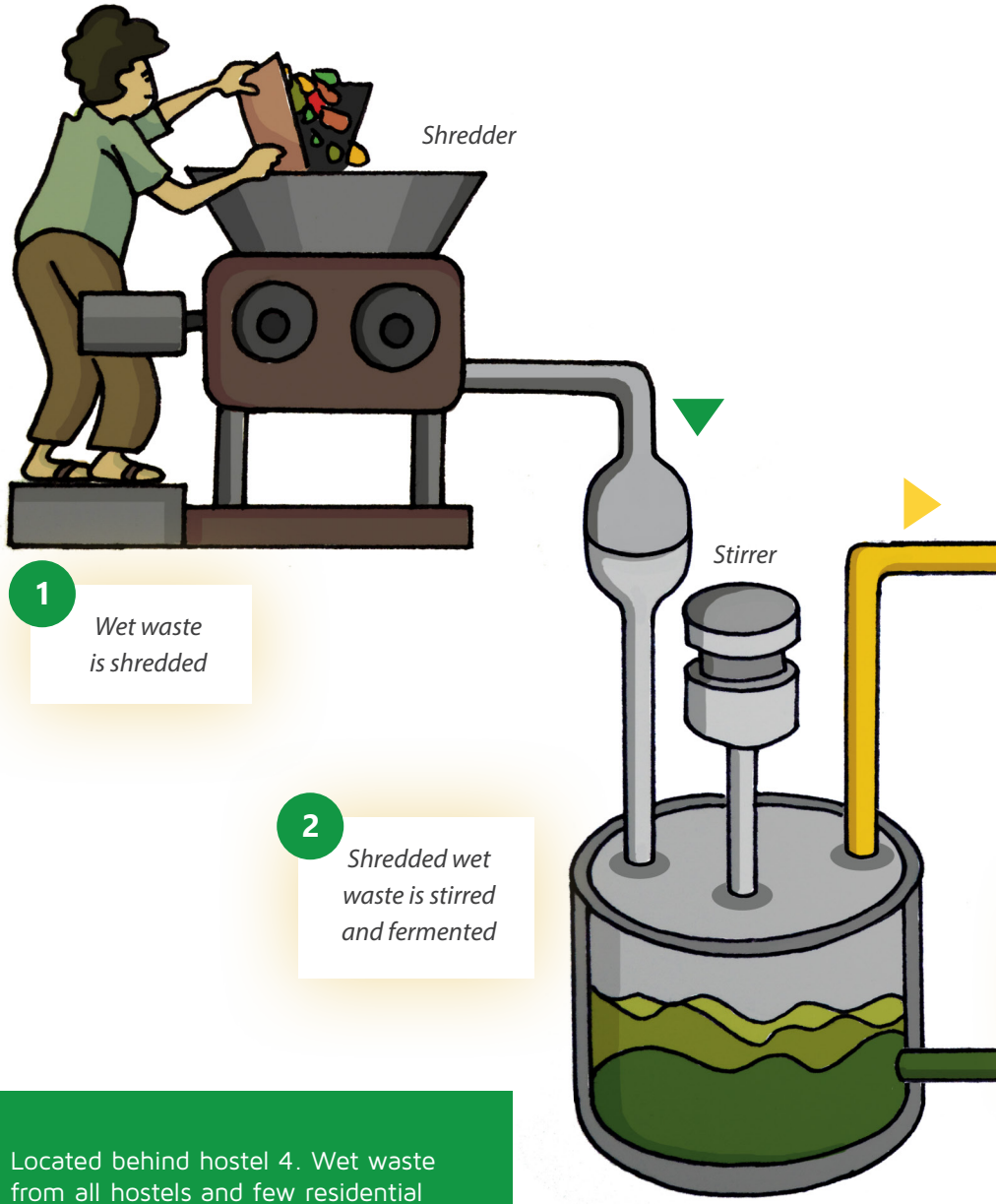
Biogas plant based on BARC technology. Capacity - 2 Tons per day.

Food Waste from the Hostels

Food is prepared four times a day in all 16 hostels – breakfast, lunch, evening snacks and dinner. Each time a lot of food is wasted. Mess food has always been among the top most compains from the students. They either dont like the food taste or the menu. Only during vacations, when students go home, food waste drastically decreases. Twice a day PHO vehicle goes to all the hostels to collect food waste, which is stocked in the biogas plant area for a day and next day it is processed.

Food wasted mindlessly

Food waste being shredded

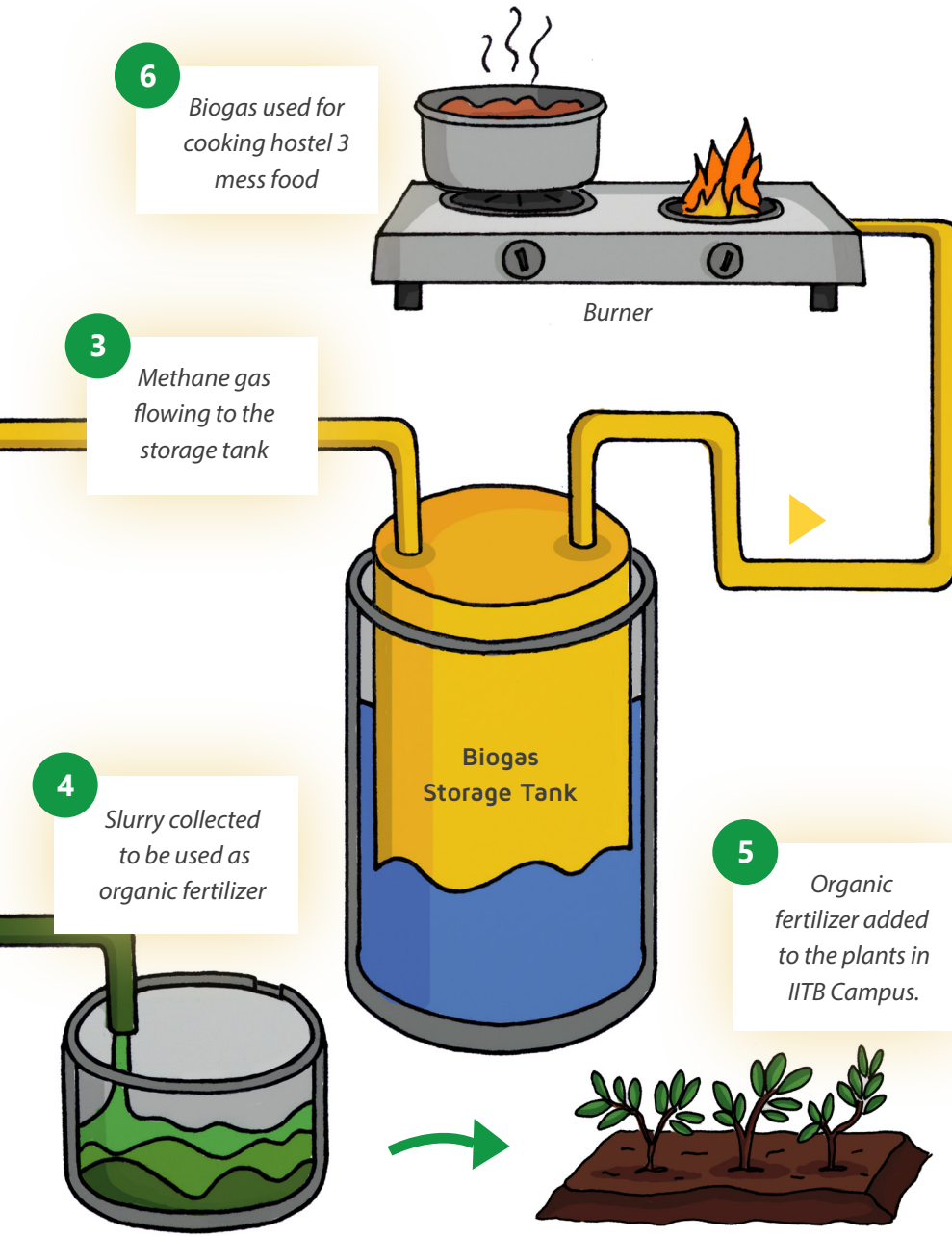


1 *Wet waste is shredded*

2 *Shredded wet waste is stirred and fermented*

Located behind hostel 4. Wet waste from all hostels and few residential buildings goes here. The gas is used to cook hostel 3 mess food. Supports 2000 Kgs wet waste which gives fuel for 3 cylinders.

Working of the Biogas Plant in IITB Campus

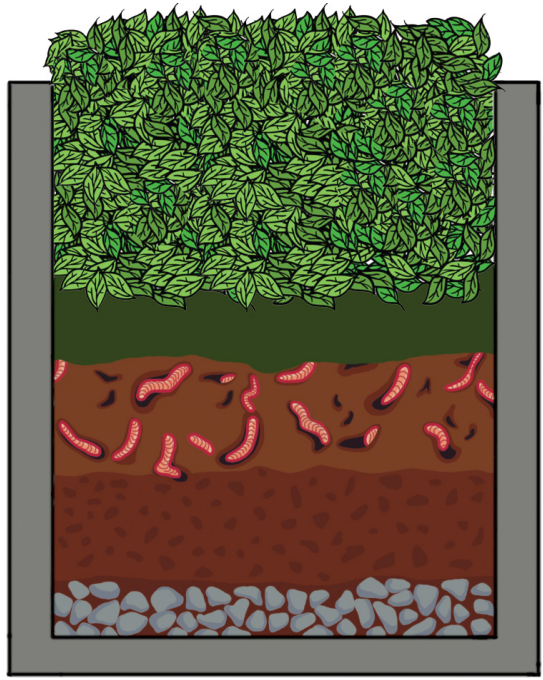


You can make this vermibed design at home in your small terracotta planter.

Do not worry, worms wont come out of your planter unless you create unfavourable environment for them.

Keep it moist.

Working of the Vermi Composting Unit in IITB Campus



Leaf Litter and Food Waste

Cowdung

Vermiculture

Soil

Limestone

Dont you think these people who clean our awful wet waste must have lost their appetite and enthusiasim to eat their food?

Do not mix your dry and wet waste.

“Seperately collected wet waste too contains some amount of plastic, which we have to again sort out with our hands before sending it to the biogas plant or the composting unit”

- Ramnath

Landfills have become taller than our high rise buildings.

Along with the rest of the city, IITB Campus is equally contributing to the harm caused to the environemnet by sending waste to the landfills.

7. What Harm is our Waste doing to the Environment?

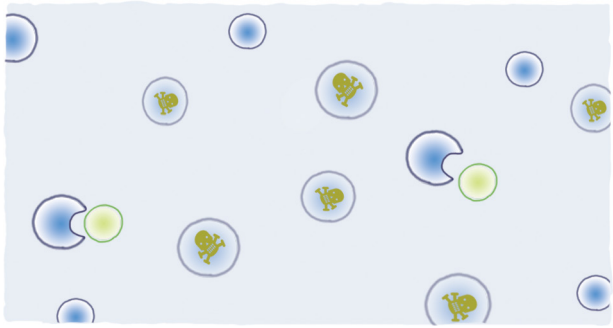
IITB high rise buildings like Aravali, Ananta and Nilgiri.

What happens when plastic goes to the landfill?

This is your mixed waste with lot of plastic bags, bottles and wrappers in it.

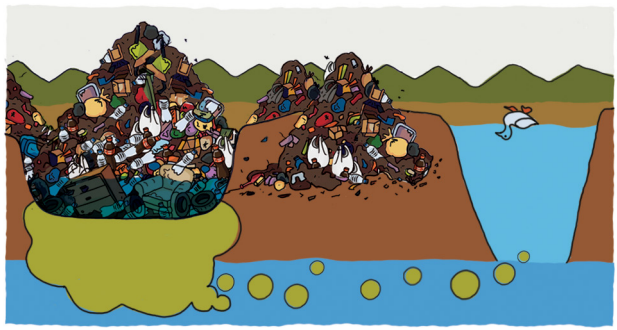
Plastic waste mixed with other waste ends up in a landfill. This huge dump is daily trashed in landfill and it continues to take up lot of space.

As plastic sits there being compressed among the layers of other junk, rain water fills through the waste.



The water absorbs the water soluble compounds that plastic contains.

And some of these compounds are highly toxic and together they create a harmful liquid called Leachate



Leachate enters the ground water, soil and streams poisoning the ecosystems and harming wildlife.

For years and years plastic waste goes on accumulating, It takes 1000 years to decompose.

Human activity is speeding up the process of global warming, yet we continue to over produce and waste even more precious global resources.

We are turning resources into waste faster than waste can be turned back into resources.

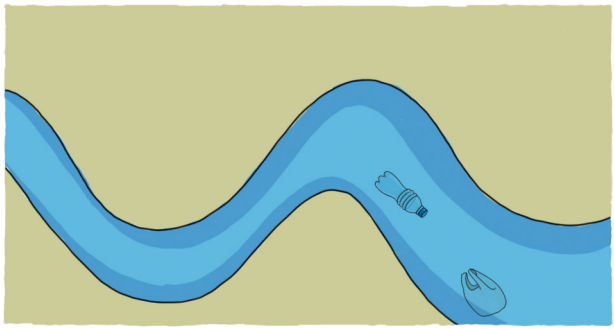
Conseuences of Improper Waste Management

Our activities, especially the constant dumping of huge amounts of waste to landfills, has increased the amount of greenhouse gases in the atmosphere. Untreated and mixed waste lying on these open grounds for long long time undergoes reaction creating a lot of heat. Infectious diseases, breathing problems, allergies occur. Unsegregated wet waste and dry waste together on landfills release methane gas. Humans dwelling around landfills, use it as a place to defecate. It makes the surrounding highly inflammable. A small matchstick if set to light can lead landfill to catch fire creating dark smoke. Leachate generation is a major problem for landfills and causes significant threat to surface water and groundwater. Leachate can be defined as a liquid that passes through a landfill and has extracted dissolved and suspended matter from it. Leachate results from precipitation entering the landfill from moisture that exists in the waste when it is composed. Hence, mixed wet and dry waste is dangerous.

Many times, due to not enough land available for dumping, garbage is thrown into water bodies polluting water and affecting water lives. Landfills stink horribly and workers have no option to it. They are not provided with the required accessories to protect themselves while working in dirt. Some people fall sick inhaling methane. Waste which can be recycled is thrown mixed and is never segregated. This contibutes in the loss of nation's wealth. For new production, again and again earth is dug. Wet waste if not composted, it leads to use of chemical fertilizers for agriculture. Habits like wasting food unnecessarily and unthoughtful dumping of this waste wherever and whichever places found invites rats and dogs creating mess.

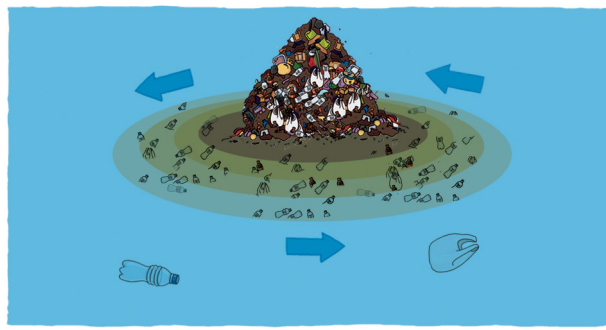
What happens when plastic is disposed into waterbodies?

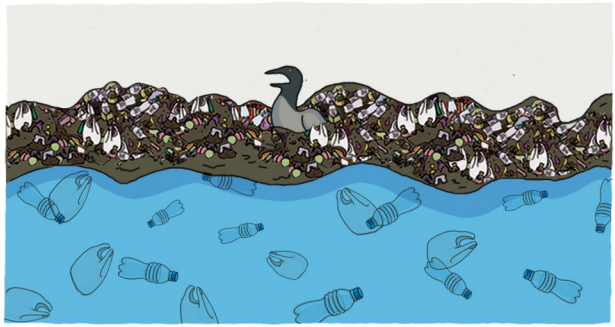
To avoid tipping fees and lack of space in landfill are the two important reasons for municipal solid waste being disposed in the water bodies like rivers.



Plastic floats from the river to the ocean.

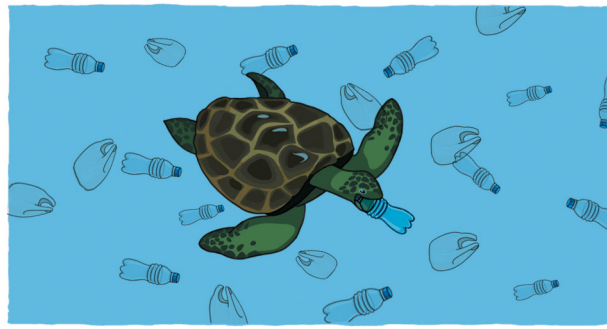
Slowly it floats and joins the massive patch of garbage where trash accumulates. Here, ocean currents trap millions of pieces of plastic.

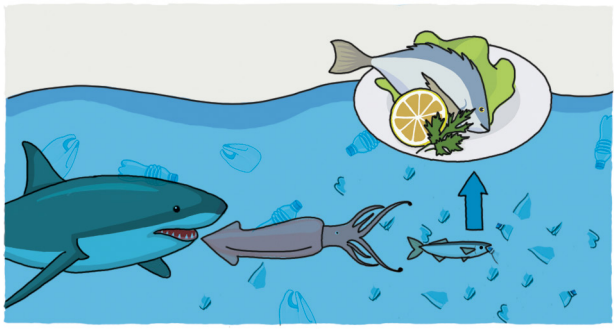




Some animals like seabirds get entangled in the accumulated trash.

These animals mistake plastic for food. Plastic makes them full when they are not and they starve to death.





Toxics from the plastic are passed to the complete food chain.

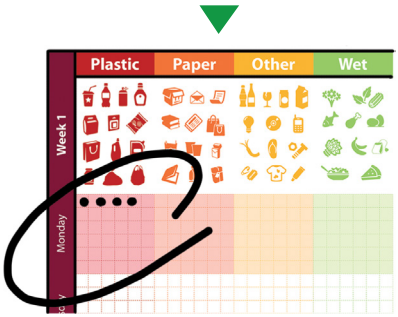
Most plastics are non-biodegradable. They break down in tiny pieces called micro-plastics which we are eating through the spoilt food chain.

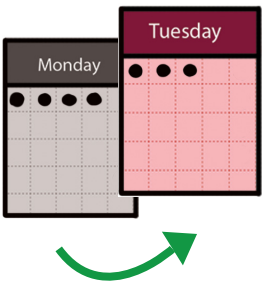
Consume Less

Make or buy only how much you want to eat!

8. How to Manage our Waste?

Step 1: Lets study our waste





1 Lets study our waste - Chart
Here is a weekly chart which has four categories of waste. Plastic, Paper, Other and Wet.

2 Mark your waste
Everyday the number of times you throw any unit of waste, mark a dot in a small square of the respective waste category.
1 Dot = 1 Unit of waste
Eg. ***One*** *Chocolate wrapper /* ***One*** *Paper /* ***One*** *Safety pin /* ***One*** *slot of onion peels =* ***One*** *Dot.*

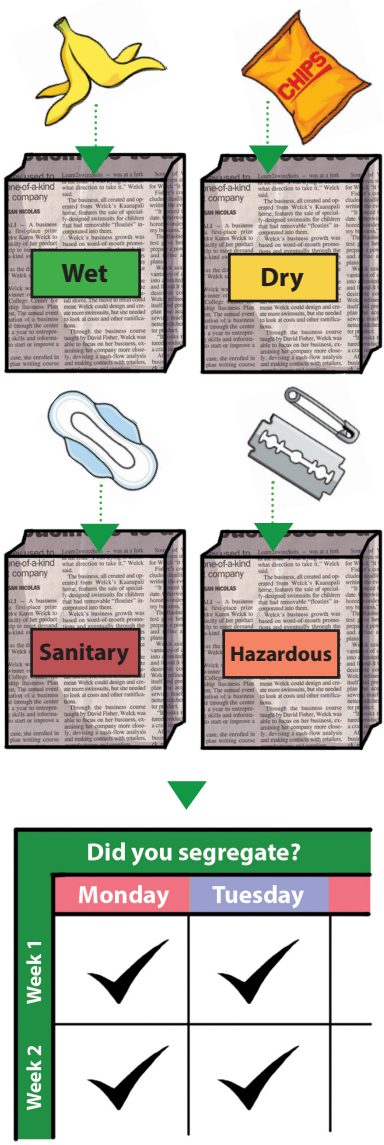
3 How many black dots?
At the end of the day you'll see many black dots which represents the waste generated in your house on that single day.

4 Consume Less
Mark dots on the given chart for next one week. Each day and reduce one dot atleast by generating 1 unit of waste less.

Segregate

Once you keep seperate bins or paper bags for different categries, it will surely help you get into the habit of segregation.

Step 2: Lets segregate our waste



1 The four categories

Now that we know how much waste we generate, its time to start segregating it into, **Wet, Dry, Sanitary and Hazardous** waste categories.

2 Paper Bag

Make or buy a stock of paperbags made from newspaper or recycled paper to dispose waste seperately in each one.

3 Did you segregate?

Daily PHO garbage collector will mark on the chart if you have segregated or not. Later chart will be collected by PHO. If you have segregated for the whole month, then you will be declared as a **Clean Family**. Its an honour!

4 Practice segregation

In the beginning you might find it difficult to throw in different bags, but once you get used to it, you ll love it. So, continue practicing for one whole month.

5 How does it feel?

Isnt your waste looking clean now? See the smile on the face of PHO garbage collector when you give her your clean waste.

Dont throw the things which you can use again.
Recycle what you dont want to use anymore.

Use your creativity to make reuse of the things. The stuff you actually throw away can be turned into new products. Almost everything!

Step 3: How can we segregate better?

Keep your recyclables away from other dry waste

Plastic

Paper

Metal

Glass

eWaste

Daily Dump Composter

What can be recycled?
Once you seperate your wet waste, you can recycle most of your other waste materials at home too. The following waste can be recycled.

1. **Plastic bottles and containers.**
2. **Newspapers, Books, Pamphlets and Magazines.**
3. **Metal like Coke and Beer tins or any hardware.**
4. **Beer and Medicine Glass Bottles.**
5. **Old Mobile phones, computer, Wires, Cables and Plugs.**

Clean, dry and store in categories so that you can sell easily and help your kabadiwalla.
Sell these to local kabadiwalla for recycling! This way you throw out less into the landfill everyday. Nearly 80% less!

Scrap dealers understand the potential of waste as a raw material.

Waste pickers and scrap dealers form an informal system of waste collection and recycling and help us send less waste to the landfills.

Step 4: Get in touch with kabadiwallas

They ll be happy to collect waste from your home

Shri Maruti Paper Mart
Mr. Naresh Jain
98929 57740
Opp. to IIT Main Gate

“ Waste is valuable to us. Poor cant afford new books, toys, chair and so on, they buy from us and fufill their needs ”

Lakshmi Old Paper Mart
Mr. Mahaveer Jain
9820880248
Opp. to IIT Main Gate

We buy all old things. All plastic, metal(brass, aluminuim, copper, iron), glass bottles, books, waste paper, magazines, newspaper. No rubber and clothes.

Compost it.

Though PHO is already doing it for you at Vermi Composting unit, you can manage your wet waste at home itself. IITB needs multiple composting solutions at different levels, central, community and household level to effectively manage its wet waste.

Step 5: Lets compost our wet waste

'Terracotta Khamba' to compost at home

"Come to IDC department to see the Khamba. It looks beautiful"

Daily Dump Composter

What is Composting?

It is not a new idea. In the natural world, composting is what happens as leaves pile upon the forest floor and begin to decay. Eventually nutrients from the rottting leaves are reclaimed by the living roots. This completes nature's recycling process.

Composting at Home is Easy

Traditionally composting at home was done in a pit in the corner of a garden. But many homes in IITB campus do not have much exterior space. Hence, pit is not a viable option. With this Khamba composting at home is convenient, fun, hygienic and odour free. It involves almost no looking after and you can build into your routine. A couple of composting cycles and you will be a composting expert.

What goes in my compost?

What can go?

1. Fruits and vegetable peels, citrus fruits (like tamarind and lemon)
2. Mango and Tamarind seeds (take long time to compost)
3. Washed bones of meat, fish and chicken
4. Corn cub, sugar cane water melon, stalks of cauliflower and flowers
5. Shredded old envelopes, tissue paper and cloth
6. Cooked food and rotten vegetables
7. Coffee powder, coffee decoction, tea bags and leaves, tamarind pulp
8. Crushed egg shells, coconut husk (No shell)
9. Human sweepings, human hair and nail clippings

What cannot go?

1. Paper plates with plastic lining and paper cups
2. Foil wrappers and shiny packaging of chocolates, sweets, namkeen, buiscuits, gutka, chewing gum
3. Plastic bags and snipped corners of milk packets
4. Dead animals and animal hair. Human and animal droppings.
5. Shredded old envelopes, tissue paper and cloth,
6. Batteries, cigarette butts
7. Weed and diseased plants.
8. Coconut shell, Medicines
9. Liquid mixed waste like sambhar and chutney
10. Chemicals or cometics

Visit Daily Dump

Nano Composter for kids

Small Khamba for family of 1-3

Large Khamba for family of 4-5

Stand for recyclables

Daily Dump Khambas have been designed to manage wet waste without taking up too much space in our homes. They have different forms with modular parts that allow us to convert organic waste into compost easily in just 45 days.They have composters for individual homes and for communities like flats, schools, offcies, clubs, colleges, restaurants.

Daily Dump
COMPOST AT HOME

www.dailydump.org

The website is regularly updated with new material that might interest you.

9. Meet the Clean people

“Managing waste is a skill which is a necessity for every person today”

Public Health Officer

Mr. B. S. Patil is into the the field of solid waste management from last 20 years. He is the only person who is handling solid waste management and cleanliness of the whole campus. The 450 workers are managed by him.

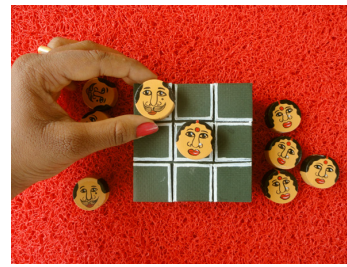
“My eyes keep searching for waste so that I can make many more such toys”

Gauri, student at IDC

She collects waste like plastic bottles, iron pieces, paper cups and boxes, metal tins and empty ball pens from wherever she finds and makes colourful and frugal toys out of it. These thoughts towards waste comes to her from her mother.

Bins out of waste paper coasters

Toys out of broken hair clips



Game out of plastic bottle caps

“I found these wooden planks lying behind CSRE building”

Damayanti, IITB resident

She has been a creative person when it comes to decorating her house. Not by simply buying furniture from the shop but personally making it with the help of her kid and husband. They all love doing this art. Its a mirror made and painted by her at home and now its in her bedroom on a big wall.

“I have not thrown my wet waste at all after started composting at home”

Raja, IITB resident

Raja Mohanty is a professor at IDC, IITB. He is a self reliant person. He has a beautiful house in one of the high rise buildings where he has kept his terracotta composter. He manages his wet waste at home. Its one of the live examples from the campus of composting being possible in urban homes, flat. Apart from wet waste he gives out only what cant be recycled at home. He does not use plastic bags to dispose waste at all.

This project is aimed at understanding what design interventions can do to the status of solid waste management in the campus of IIT Bombay. Understanding the consumption and waste generation habits of the residents of IIT Bombay and bringing a change in their behavior towards waste by bringing change in their consciousness towards cleanliness. More than 6000 people dwell in this beautiful campus but not many are aware of who keeps the campus beautiful and how is their waste managed. This book illustrates the potential of the campus of IIT Bombay to go Zero Waste. It visually explains the present status of the campus's solid waste management and how residents can easily adapt the zero waste practices.

IDC
Industrial Design Centre,
IIT Bombay Project