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7.1.3: MANAGEMENT OF DEGRADABLE AND NON-DEGRADABLE WASTE

❖ Solid Waste Management

- Waste Segregation
- Composting& Vermicomposting
- Waste Paper Recycling
- Tetra Pak Recycling RUR
- Plastic Recycling
- Multi Layered Plastic (MLP) Recycling
- Broken Glassware Recycling
- E- Waste Recycling
- Campus Festival Waste Management Guidelines

❖ Liquid Waste Management

- Grey Water Recycling

❖ Waste Management Awareness Lectures on Campus

- **2019 - 2020**
  - Visit to College Compost Bin for first year students - 2019-2020
  - Recycling of Plastic and Waste Management Business Ventures - 25th Feb. 2020
  - Field Visit to Hindustan Petroleum Water Purification Plant - 5th Feb. 2020
  - Multi Layered Plastic (MLP) Recycling - 29th Aug. 2019
  - Waste Management - 19th Aug. 2019
- **2018 - 2019**
  - Waste Water Treatment: Poster Presentation at International Conference (2nd Prize) 9th – 11th Jan. 2019
  - Wet Waste Management - 4th Dec. 2018

- **2016 - 2017**
  - Solid Waste Management - 8th Mar. 2017
- **2015 - 2016**
  - Field Visit to Water Purification Plant - 20th Jan. 2016
  - Solid Waste Management - 4th Jan. 2016

❖ **Xavier's Environmental Committee (XEC)**

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SOLID WASTE MANAGEMENT

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1. WASTE SEGREGATION

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Red and green-coloured waste bins are placed at several locations in the campus to collect dry and wet waste, respectively. Plastic bottles and other recyclable waste is collected in the red-coloured 'dry' bins, while biodegradable and paper waste is collected in the green-coloured 'Wet' bins. The labels on the bins have pictorial representation of the kind of waste to be disposed of into each bin. These labels have been made by students, thus involving them in the waste segregation process. Large sized posters on waste segregation are mounted on the college canteen walls and awareness videos are displayed on the digital signage at vantage points in the college campus.

Waste segregation: Red bins (DRY - Plastic and recyclable waste) and Green bins (WET – Biodegradable and paper waste)

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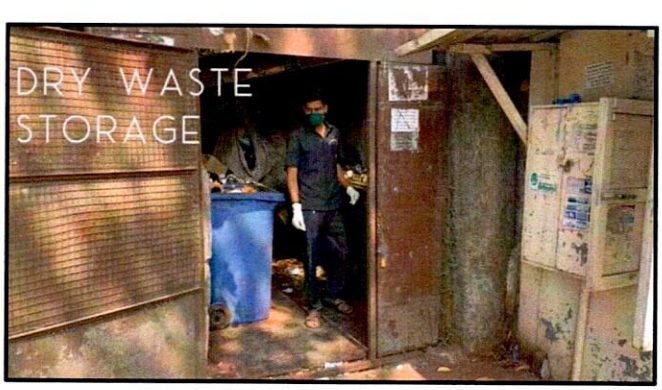
Video Grabs of Waste Segregation on Campus

Dry waste collection from bins placed across campus

Wet waste collection from bins placed across campus



Temporary dry waste storage until disposal to Municipal waste collection

Latitude	18° 56' 32.90" N
Longitude	72° 49' 53.17" E

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2. COMPOSTING & VERMICOMPOSTING

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Composting of wet waste from the college canteen was initiated by the Department of Microbiology in 2017 under the guidance of the NGO, Stree Mukti Sanghatana, and continues till date. The compost bin was inaugurated by rector, Fr Dr Anthony D'Souza SJ, on 30th June 2017. The solid waste from the college canteen is segregated as wet and dry waste. The wet waste is then used for composting. The canteen staff has been instructed about the segregation of the organic waste and plastic waste. Since October 2018, a helper from the NGO, called a Parisar Bhagini, has been employed by college, who comes in daily and ensures only wet waste is added to the bin. Large amounts of canteen waste are passed through the food shredder purchased in 2019 and then added to the compost bin. To ensure proper composting, smaller plastic crates are now being used instead of the single large compost bin. Compost made on campus is used in the college gardens. Plans are on the anvil to sell the excess compost generated and earn revenue for the college.

Post graduate students of the college are also trying to develop a microbial consortium that can act as a biological tool for rapid degradation of organic solid wastes. Undergraduate students are studying the isolates from the compost and characterizing them. However, these are still in preliminary phase and work has completely stalled due to the ongoing pandemic.

Inauguration of Compost Bin by Rector, Fr Dr Anthony D'Souza, SJ
(30th June 2017)

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First batch of composting started with wet waste from College Canteen
(30th June 2017)

Compost Bin created under the guidance of the NGO StreeMuktiSanghatana in 2017

Latitude	18° 56' 33.74" N
Longitude	72° 49' 51.47" E

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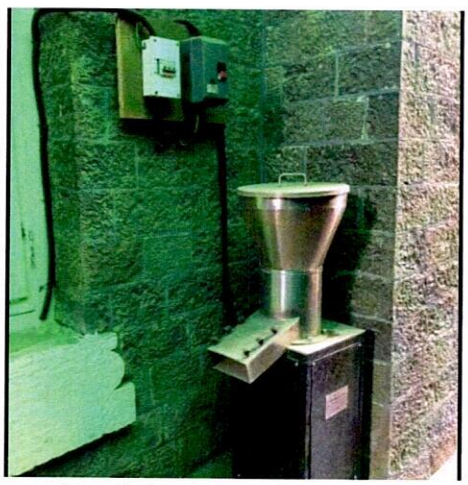
Inside of the Compost Bin

Latitude	18° 56' 33.74" N
Longitude	72° 49' 51.47" E

Composting in small plastic crates



Food shredder machine

Latitude	18° 56' 34.16" N
Longitude	72° 49' 53.12" E

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ParisarBhagini segregating wet waste from college canteen for composting (video grabs)

Latitude	18° 56' 34.16" N
Longitude	72° 49' 53.12" E

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DEPARTMENTAL COMPOST BINS

To help segregate the waste generated in each department, and to compost the wet waste that was generated, the post graduate students of the Department of Microbiology provided each department with plastic bins of different sizes (large, medium, and small), depending on the need of that particular department. The bins had holes on the sides for providing a well-aerated environment for the compost to develop. Plastic netlon mesh was attached to the inside of the bin, to prevent the compost from falling out from the sides of the bin, at the same time allowing air to flow through. Different departments are using the bins to compost wet waste, *e.*g., the Botany department is using it to prepare small quantities of compost which is utilized for plants grown by the department on the terrace and in the college garden. Small left over pieces of fruits, vegetables, peels and coverings of fruits, and similar kind fresh plant material is dumped inside the bin along with small quantity of mud and dried leafy material to prepare compost. The Botany lab plant waste is also added to this bin in order to create compost.

Botany Department Compost Bins

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VERMICOMPOSTING

The earthworm compost bin is located beside the front garden of the college behind LR 01. It is looked after by the Botany department. The compost bin is utilized to prepare compost during rainy season especially, as well as all year round. The bin is made up of cement with two chambers which are approximately square in area and raised to a height of 2 feet, and are covered by a tin cover. There is a partition between two chambers but it has small openings. The earthworms eat the leafy material freshly dumped in one chamber and then travel to the next chamber to again eat the fresh material present there. The leafy material degraded in the first chamber can be utilized as fresh compost for growing garden plants. The chamber is again filled up with mixture of green leafy material and some soil to aid compost preparation with the help of earthworms. The compost bin was prepared in year 2005 as a part of project of a BMM student under guidance of Prof. S. P. Periyanayagi.

Latitude	18° 56' 34.12"N
Longitude	72° 49' 51.44"E

Inside of the vermicomspost bin Vermicompost bin from the outside

Vermicompost bins

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3. WASTE PAPER RECYCLING

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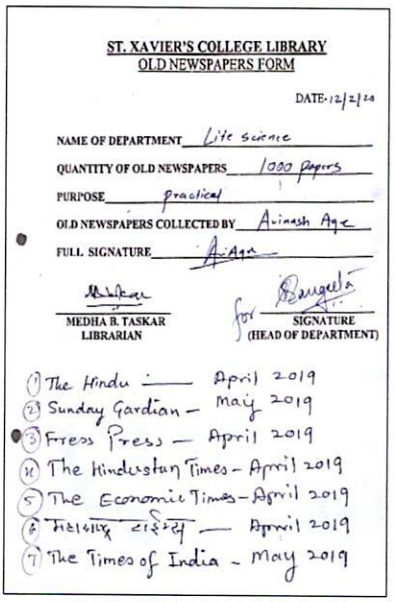
(A) RECYCLING OF OLD NEWSPAPERS

The college has been recycling waste newspapers for several years. Old newspapers stored in the library are reused by the departments, the general office, the exam centre for wrapping answer paper bundles for storage, and especially the science labs for wrapping and autoclaving glassware. This trend continues even today.

2019 - 2020



ST. XAVIER'S COLLEGE LIBRARY
OLD NEWSPAPERS FORM

DATE- 12/2/20

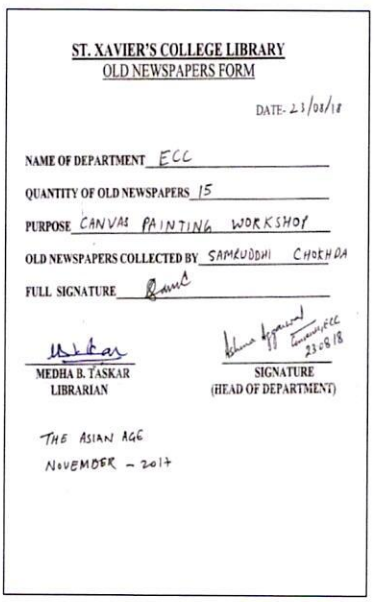
NAME OF DEPARTMENT Life science
QUANTITY OF OLD NEWSPAPERS 1000 Papers
PURPOSE practical
OLD NEWSPAPERS COLLECTED BY Avinash Age
FULL SIGNATURE A. Age

MEDHA B. TASKAR
LIBRARIAN

for SIGNATURE
(HEAD OF DEPARTMENT)

(1) The Hindu — April 2019
(2) Sunday Gardian – May 2019
(3) Freee Press — April 2019
(4) The Hindustan Times - April 2019
(5) The Economic Times - April 2019
(6) [illegible] — April 2019
(7) The Times of India - May 2019

2018 - 2019



ST. XAVIER'S COLLEGE LIBRARY
OLD NEWSPAPERS FORM

DATE- 23/08/18

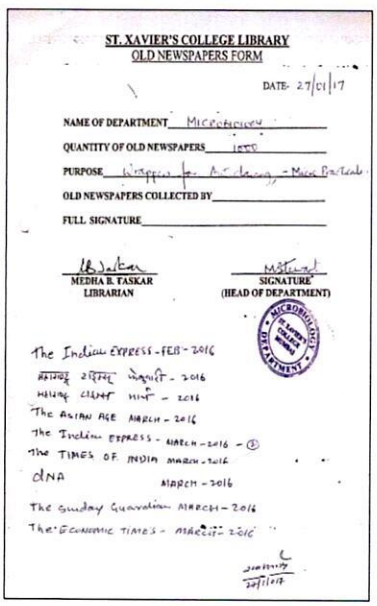
NAME OF DEPARTMENT ECC
QUANTITY OF OLD NEWSPAPERS 15
PURPOSE CANVAS PAINTING WORKSHOP
OLD NEWSPAPERS COLLECTED BY SAMRUDDHI CHOKHDA
FULL SIGNATURE

MEDHA B. TASKAR
LIBRARIAN

SIGNATURE
(HEAD OF DEPARTMENT)

THE ASIAN AGE
NOVEMBER - 2017

2017 - 2018



ST. XAVIER'S COLLEGE LIBRARY
OLD NEWSPAPERS FORM

DATE- 27/01/17

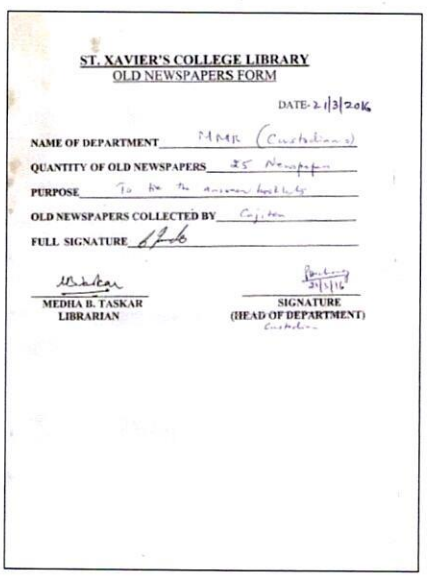
NAME OF DEPARTMENT Microbiology
QUANTITY OF OLD NEWSPAPERS 1000
PURPOSE Wrapping for Autoclaving - Micro Bacteria
OLD NEWSPAPERS COLLECTED BY
FULL SIGNATURE

MEDHA B. TASKAR
LIBRARIAN

SIGNATURE
(HEAD OF DEPARTMENT)

The Indian EXPRESS - FEB - 2016
[illegible] - 2016
[illegible] - 2016
The Asian Age MARCH - 2016
The Indian Express - MARCH - 2016 - ②
The TIMES OF INDIA MARCH - 2016
dNA MARCH - 2016
The Sunday Guardian MARCH - 2016
The Economic TIMES - MARCH - 2016

2016 - 2017



ST. XAVIER'S COLLEGE LIBRARY
OLD NEWSPAPERS FORM

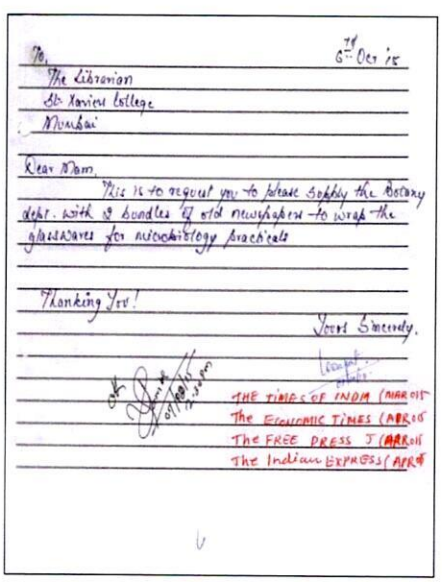
DATE- 21/3/2016

NAME OF DEPARTMENT MMR (Custodians)
QUANTITY OF OLD NEWSPAPERS 25 Newspapers
PURPOSE To be [illegible]
OLD NEWSPAPERS COLLECTED BY Cajeton
FULL SIGNATURE

MEDHA B. TASKAR
LIBRARIAN

SIGNATURE
(HEAD OF DEPARTMENT)

2015 - 2016



To,
The Librarian
St. Xaviers College
Mumbai

6th Oct '15

Dear Mam,
This is to request you to please supply the Botany dept. with 8 bundles of old newspapers to wrap the glasswares for microbiology practicals

Thanking You!
Yours Sincerely,

THE TIMES OF INDIA (MARCH
The ECONOMIC TIMES (MARCH
The FREE PRESS J (MARCH
The Indian EXPRESS (APRIL

Recycling of Old Newspapers (Samples: 2015 - 2020)

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(B) ECHO – WWF (2019 - 2020)

ECHO stands for 'Environment Conservation Hero' of the Year. It is a programme by the World Wildlife Fund – India (WWF-India), where enrolled colleges have to design, develop and implement a project related to the environment conservation theme. The activity is spread over the entire academic year. At the end of the academic year, the projects are reviewed and evaluated on set parameters at the State Elimination Round and the selected college from the state gets a chance to participate in the National Level Summit. The college showing the maximum impact of their project at the national level is declared the 'Environment Conservation Hero of the Year.

Students from the Department of Zoology enrolled in this project in 2019-20. The project began with the idea of eliminating plastic from the college campus, and revolved around the key theme of reducing, reusing and recycling. It was decided to replace plastic bins with paper bins in classrooms and reusing waste paper to make the same. The paper dustbins were made by using the newspaper waste collected in the college library. After trying out numerous designs, the team came up with a final design that was sturdy enough to be used across the college.

ECHO project – Dustbins made from waste Newspapers from the College Library

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(C) WASTE PAPER RECYCLING –SAMPURN(E)ARTH (SESPL)
(2018 - 2019, 2017 - 2018, 2016 - 2017)

Since year 2016, the college has collaborated with Sampurn(e)arth Environment Solutions Private Limited (SESPL) to recycle the large amounts of paper waste generated. SESPL offers customized end-to-end decentralized solid waste management solutions services. They assess the quality of the waste generated by the college and the quantity, and collect and recycle it in exchange for Green Points. Segregated waste is weighed on the spot, in the presence of SESPL supervisor and an authorized person from the college. Details are recorded at both ends to keep regular account of the waste collection. For every kg of recyclable waste collected, the college earns Green Points, which are different for different types of wastes.60% of the Green Points can be redeemed for customized stationery made using 100% recycled paper obtained from recycling Tetra Pak cartons.This saves the college some expenditure on purchase of internal stationary.For example, in 2016 alone, in exchange for the Green Points, college obtained 182 reams of A4 size paper, with 500 pages in each ream. Over 3 years, a total of 16,206 kg of waste paper was recycled earning the college 1,04,047 Green Points. Details of the Green Points earned are given below:

Month/Year	Recyclable Waste collected (kg)	Green Points earned
Nov. 2016	3,920	21,060
Dec. 2016	1,620	10,884
Nov 2017	3,300	22,380
May 2018	7,060	47,610
Sep. 2018	306	2,113
TOTAL	**16, 206 kg waste recycled in 3 years**	**1,04,047 Green Points**

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4. TETRAPAK RECYCLING

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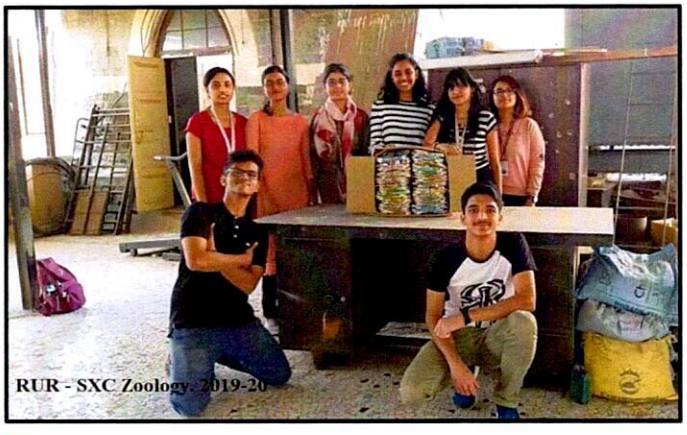
- **TETRAPAK RECYCLING (RUR) (2019 - 2020, 2018 - 2019, 2017 - 2018)**

With a variety of fruit juices and other beverages being sold in tetra paks, a lot of tetra pak waste was being generated on campus. In 2016, the Xavier's Zoology Association (XZA) took the initiative and collaborated with the RUR Green Life Pvt. Ltd. and participated in their 'Go Green with Tetra Pak' campaign to promote a culture of recycling on the college campus starting academic year 2017-18. The larger aim is to reduce the cutting of trees for paper manufacturing. RUR Greenlife is a company founded in 2009 to provide decentralized, sustainable, end-to-end waste management solutions. Recycling bins were installed in the canteen foyer where students and staff could deposit the tetra paks at their convenience. The disposed of tetra paks from college and students' homes were collected, washed, dried and deposited with the nearest Sahakari Bhandar for recycling. These tetra paks are recycled into notebooks, benches, writing paper and donated to underprivileged and resource constrained schools. Between 3000 – 3200 tetra paks are being collected and recycled every year.

2019 - 2020



Tetra Pak Recycling (2019 - 20)

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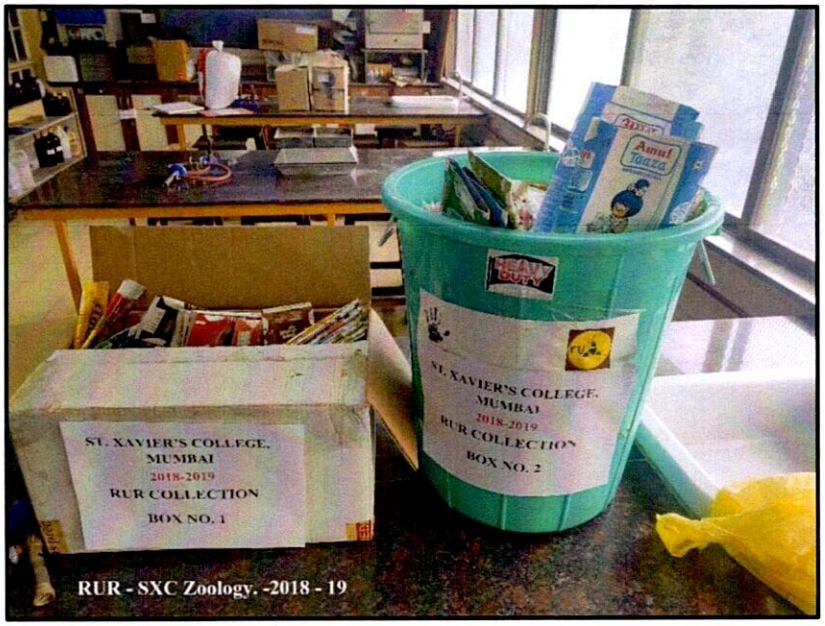
2018 - 2019



Tetra Pak Recycling (2018 - 19)

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2017-2018

Tetra Pak Recycling (2017 - 18)

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5. PLASTIC RECYCLING

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The plastic waste in college is being segregated by means of the red and green segregation bins for several years. This segregated plastic waste is disposed of in the Municipal plastic waste.

Recently, the college participated in the 'Mumbai Plastic Recyclothon' between 2nd to 8th October 2019, organized by the NGO Project Mumbai. Waste plastic (bottles, spoons etc.) were collected and deposited with the NGO for recycling purposes. The certificate received is displayed below.

PROJECT MUMBAI.org
People. Purpose. Positive Change.

DAAN UTSAV

CERTIFICATE OF PARTICIPATION

MUMBAI PLASTIC RECYCLOTHON
Ek Baar Phir!

www.projectmumbai.org — MUMBAI KE LIYE KUCHH BHI KAREGA!

Recognises

St. Xaviers College

for their display of civic responsibility by Donating Plastic for The Mumbai Plastic Recyclothon - Ek baar phir from the 2nd-8th of October 2019

SHISHIR JOSHI
CEO & Founder, Project Mumbai
www.projectmumbai.org

A Public Service Initiative Sponsored by HDFC — WITH YOU. RIGHT THROUGH

Recycling Partner THE SHAKTI PLASTIC INDUSTRIES

Radio Partner 92.7 BIG FM

Design Partner JJ

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6. MULTILAYERED PLASTIC (MLP) RECYCLING

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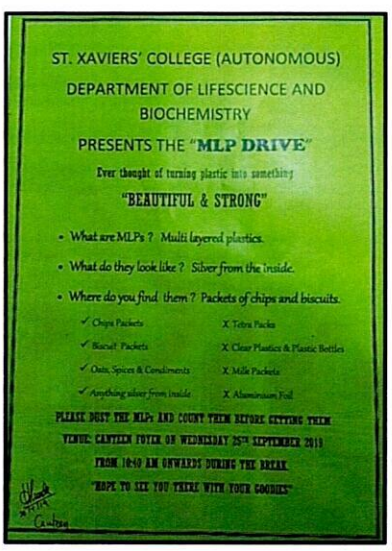
- **MULTI LAYERED PLASTIC (MLP) RECYCLING**
  (2019 - 2020, 2018 - 2019)

Safai Bank of India is an organization that works in collaboration with WWF India. It is a Section 8 non-profit company registered under the Companies Act of 2013 that works with Multi- layered /laminated Packaging (MLP) waste, which is one of the largest types of plastic waste being generated. These are the silver-coloured metallic inside plastic bags used to package food items. They have very poor disposal procedures. Recycling MLP waste helps in preventing their being dumped in dumping grounds where otherwise they burn at low temperatures, releasing toxicants that pollute the environment.

The Safai Bank of India functions like a regular bank with branches, and each branch has account holders. To manage these accounts there is a Branch Coordinator. The various schools, colleges, departments, societies, organisations and others interested in MLP collection, register with Safai Bank and act as the branches. The respective organization then appoints the branch co-ordinator responsible to keep a record of this collection from all the account holders and also to co-ordinate with Safai Bank. Members collecting MLPs also have to register with Safai bank as account holders. The Account holders deposit their MLP collection at their respective branch and then the branch co-ordinator has to make an entry in the respective account holder's account. Once a substantial number of MLPs are collected the co-ordinator informs Safai Bank who come to the concerned branch and collect the MLPs for its further disposal as per the Waste Management Rule. The Department of Zoology and Department of Life Science & Biochemistry have taken up this activity with Safai Bank. Several students from across disciplines in the college are registered with the Safai Bank through the Department of Zoology. They are involved in active collection of MLPs from the college and their residential areas. The total collection of MLPs in 2019-20 was 16,938packets and in 2018-19 was 11,348 packets. MLP collection is an ongoing activity and will continue through the coming years.

2019 - 2020



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MLP Recycling (2019 - 20)

2018 - 2019

MLP Recycling (2018-19)

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7. BROKEN GLASSWARE RECYCLING & REUSE

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The recycling of glassware is being carried out in the department of Botany for many years. It was recently done in the academic year 2018-19, and year 2019-20. The broken glassware like conical flasks, burettes, pipettes, separating funnel, measuring cylinders, condensers, Soxhlet extractor were given for recycling. They were modified by the glass blower and supplied back to the department. As these glassware items are not fully broken, only their tips, or rim, or small edges get cracked or broken, they can be used by repairing or slightly moulding or modifying them.

Broken glassware from the Department of Botany
(Pipettes, Measuring cylinders, Conical flasks, Test tubes, Burettes, Funnels, Separating Funnels)

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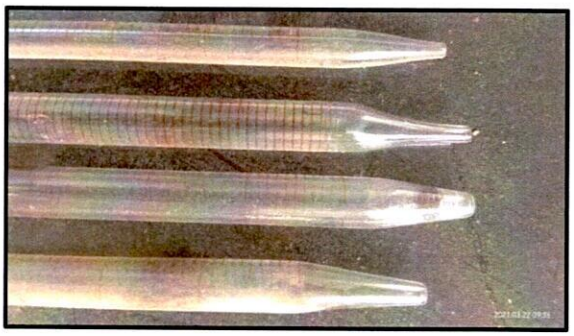
Recycled Conical Flasks

Recycled Measuring Cylinders



Recycled Pipettes

Recycled Test Tubes

Recycled and reused glassware from the Department of Botany
(2019-20, 2018-19)

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8. E-WASTE COLLECTION

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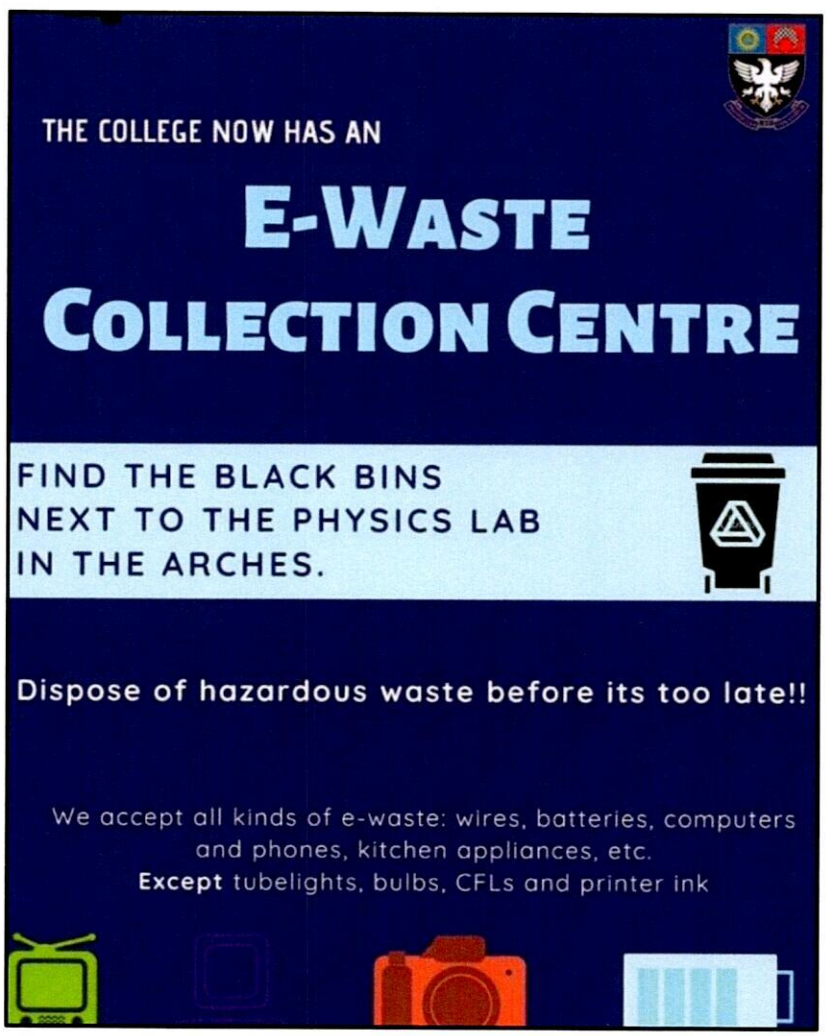
The Xavier's Environmental Committee (XEC) started an e-Waste collection drive and installed an e-Waste collection bin in March 2020. However, this drive did not take off as the pandemic lockdown was imposed immediately after. The drive will be resumed once the college reopens in regular mode.



Promotional Poster for the E-waste Collection Drive

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CAMPUS FESTIVAL
WASTE MANAGEMENT GUIDELINES

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St. Xavier's College (Autonomous), Mumbai, is known for its campus festivals and events – Malhar, IMG Janfest, Ithaka, Zeitgist, Antas, Antarchakshu and more. During such times, the college sees a heavy footfall from students and staff of other colleges and the general public. Large quantities of biodegradable and non-biodegradable wastes are generated. In 2019, soon after its inception, the Xavier's Environmental Committee (XEC) proposed a set of guidelines for waste reduction, segregation and management for all events and festivals happening within the college premises. These guidelines were first implemented at Janfest 2020, the annual 2- day concert of the Indian Music Group, held on 25th and 26th January 2020. The waste was categorized into two major categories - organizational waste and waste produced by/for attendees. There were similar sub-categories for both, with organic and non-organic waste being produced. The organizational waste was entrusted to the organisers, whereas the attendee waste required more direction/signs/convincing and better bin placement. The XEC members ensured that the waste was disposed of in the right place, and tracking it. They also spoke to and instructed the cleaners cleaning up after the event on proper disposal practices. The waste generated during the fest was largely inorganic waste such as paper cups/plates, plastic bottles, flyers, tickets, etc. Organic waste produced through the consumption of food was used for composting in the college compost bin. Almost all the waste generated was properly segregated and sent for recycling in collaboration with the NGO Stree Mukti Sanghatana. JanFest 2020 was a successful trial run for a Zero Waste Fest.

Waste collected and segregated during Indian Music Group's 2-day concert
Jan Fest 2020 (25th& 26th Jan. 2020)

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JanFest 2020 – Zero Waste Fest
Waste Segregation, Recycling and Disposal by Xavier's Environmental Committee (XEC)

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LIQUID WASTE MANAGEMENT

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GREY WATER RECYCLING

In 2019, students of the college along with their faculty mentor Dr Binoj Kutty participated in and were awarded US $4500 under the 'Youth Mentorship Programme for Environment Conservation' by the US Consulate General, Mumbai, and Ekonnect Knowledge Foundation, for their project titled 'Recycling Grey Water after treatment by Electrocoagulation' (Award No- SIN65018GR0030). Between August to December 2019, the plant was installed and a successful pilot run was performed on 28 November 2019. Ekonnect representatives visited the site on 9 December 2019 to review the work. The students and Dr Binoj Kutty made a presentation on the working status of the project to Ekonnect and US Consulate members on 30 December 2019. Grey water from the Boys' Hostel in College is being treated and reused in the toilet flushes, saving up on copious amounts of clean water.

RECYCLING GREY WATER AFTER TREATMENT BYELECTROCOAGULATION

Project Members:

1. Ms. Zubia Shaikh (T.Y.B.Sc. 2018-2019 batch)
2. Ms. KarishmaKatpitia (T.Y.B.Sc. 2018-2019 batch)

Staff Incharge:

Dr.Binoj C. Kutty
(Assistant Professor, Department of Life Science and Biochemistry)

Project Description:

This project aims to treat Grey water from Hostel Building by Electrocoagulation and convert it to usable water.

Electrocoagulation is processes which will make use of electric current (which we plan to generate from solar cells) to electrochemically precipitate or flocculate out contaminants. This unit that can be installed behind the Hostel Building. About 12,000 L of grey water is generated by the hostel per day and the building's flush water requirement is around 6000 L. The water treatment shall render the water fit for use in other flushes as well as gardening. The process would take a tank for collecting grey water, an Electrocoagulation tank, Sludge disposal tank, Filtration tank and a treated water tank from which the water can be pumped to flushes. This would involve reworking the pipelines to obtain the grey water source and supplying back the treated water to flushes.

This project for waste water treatment by Electrocoagulation was selected by 'Ekonnect Foundation' and US Consulate General's 'Youth Mentorship Programme for Environment Conservation' and awarded a grant of US $ 4500 to implement the project titled 'Recycling Grey Water after treatment by Electrocoagulation' under the Mentorship Program for Youth Leaders in Environment Conservation (Award No- SIN65018GR0030).

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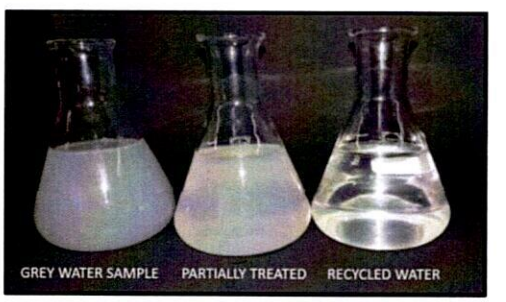
The project was taken for implementation and after various laboratory stage experiments, a pilot set up was installed at the college hostel building.

The preliminary laboratory (treatment up to 1 L capacity) work for the project was initiated prior to the mentorship programme and was scaled up (up to 10L) in the laboratory once the grant was awarded. It included purchase of DC power supply, fabrication of EC chambers of various capacities, fabrication of aluminium electrodes etc. Once the parameters were standardized it was decided to scale up the process to a pilot plant (treating approximately 800 -1000L of greywater per day in a batch of 8 hour) at the hostel building. For this a few consultations with few experts were carried out. Installation of the plant needed plumbing and civil work and installation of pipes, pumps, greywater collection tank, treatment chamber, post treatment clean-up and the recycled water collection tank. The project completion timeline was extended up to 31st December 2019 by the Ekonnect team and they had done a project completion visit on 30th December 2019.

The installed recycling plant was under test runs when the lockdown and closure of hostel took place due to the pandemic.

The entire treatment chamber has aluminium electrodes which will have to be replaced every month or about 10000L of water treatment. Once various parameters are understood, it can be converted to a full-fledged plant and scaled up to handle a higher volume. Since some of the components are electrical, they have a life expectancy of 3 to 4 years based upon usage and load applied. The plant is currently in shutdown and can be restarted only when hostels are opened in full capacity. The plant needs a fixed volume supply of grey water for its operation.

Batch Process for 1L,5L grey water treatment



Treatment Efficiency

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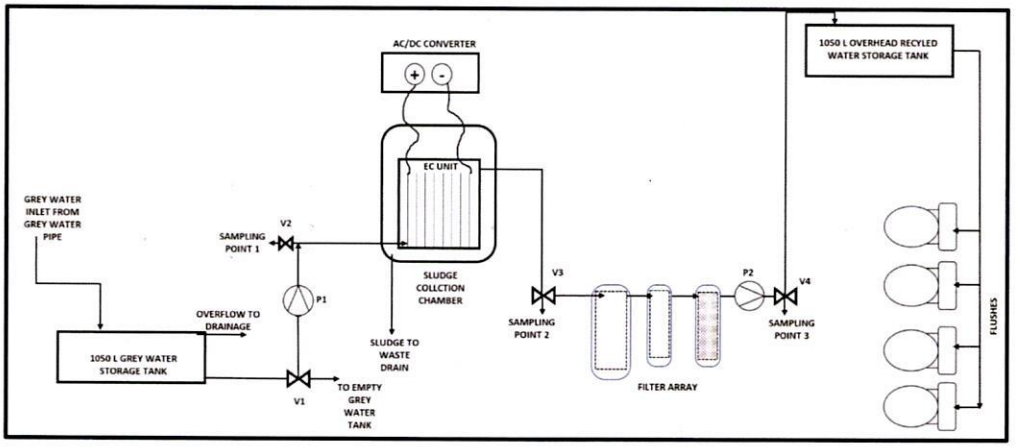

Flow Diagram of the Electrocoagulation Treatment Process

Photograph of the Electrocoagulation Treatment Pilot Plant
Site: Back side of Boys' Hostel, St. Xavier's College (Autonomous), Mumbai

Latitude	18° 56' 36.46" N
Longitude	72° 49' 56.48" E

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Winning US $4500 award at the US Consulate, Mumbai (25th July 2019)

Ekonnect representatives reviewing the set-up (9th Dec. 2019)

Project completion presentation to funding agencies (30thDec. 2019)

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WASTE MANAGEMENT AWARENESS LECTURES ON CAMPUS

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2019 - 2020

- **Visit to College Compost Bin**

  Topic: Visit to College Compost Bin
  Resource Person: Dr Aditi Sawant, Head, Department of Economics
  Audience: FYBA (Special Course: Environmental Studies)
  Date: 2019-20

Visit to College Compost Bin for FYBA Environmental Studies students

- **Recycling of Plastic and Waste Management**

  Topic: Recycling of Plastic and Waste Management Business Ventures
  Resource Person: Vishal Thigale, Director, Bola.G(Garbage) Company, Pune
  Audience: FYBA (Special Course: Environmental Studies)
  Date: 25th Feb. 2020

Lecture on Plastic Recycling & Waste Management by Mr Vishal Thigale
(25th Feb. 2020)

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- **Field Visit to Hindustan Petroleum Water Purification Plant**

Topic:	Field Visit to Hindustan Petroleum Water Purification Plant
Resource Person:	Hindustan Petroleum Authorities
Audience:	FYBA (Special Course: Environmental Studies)
Date:	5th Feb. 2020

Field Visit to Hindustan Petroleum Water Purification Plant
(5th Feb. 2020)

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- **Multilayered Plastic (MLP) Recycling**

  Topic: Don't Bin It, Bank It!
  Resource Person: Mr Rishi Agarwal, Founder, Safai Bank of India, Mumbai
  Sustainability
  Audience: FYBA students
  Date: 29th Aug. 2019

Lecture on Multilayered Plastic (MLP) Waste Management by Mr Rishi Agarwal
(29th Aug. 2019)

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- **Waste Management**

Topic: Waste Management
Resource Person: Mr Vishal Tibrewala, My Green Society
Audience: FY, SY and TYBA Political Science students
Date: 19th Aug. 2019
Description:
Mr Tibrewala He highlighted the benefits of waste segregation and explained how local government officials had started taking a more proactive role in the same. He stressed on the importance of grassroots level involvement and made a passionate appeal to the students to take up this cause.

2018 - 2019

- **Waste Water Treatment: Poster Presentation at International Conference (2nd Prize)**

Students received a prize for their work on effective waste management by the photocatalytic degradation of dyes

Poster Title: **Photocatalytic Degradation of Dyes: Towards Effective Waste Water Treatment**
Presenters: Premie Fernandes (TYBSc Chemistry), Shivani Dharmadhikari (MSc. Microbiology) and Assumpta Fernandes (TYBSc LifeScience)
Conference: International Science Conference 'From Health to Well-Being - An Interdisciplinary Approach'
Organizers: St. Xavier's College (Autonomous) Mumbai in collaboration with Creighton University, Omaha, USA.
Date: 9th – 11thJan. 2019

Shivani and Assumpta presenting their poster to the examiners

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Shivani Dharmadhikari (L) and Assumpta Fernandes (R) receiving the second prize for their poster on waste water treatment by photocatalytic degradation of dyes

- **Wet Waste Management**

  Topic: Lecture - demonstration on 'Wet Waste Management at Home and inside your Society with Simple Techniques'
  Resource Person: Mr Joseph Fernandes, Environmentalist
  Audience: FYBA students
  Date: 4th Dec. 2018


Lecture on 'Wet Waste Management' by environmentalist Mr Joseph Fernandes (4th Dec. 2018)

NAAC SSR Cycle 4 (2015-2020):
7_1_3_WasteManagement

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2016 - 2017

- **Solid Waste Management**

  Topic: 'Solid Waste Management in Mumbai'
  Resource Person: Ms. Sindhu Iyer, StreeMuktiSanghatana
  Audience: MSc Microbiology
  Date: 8th Mar. 2017

2015 - 2016

- **Field Visit to Water Purification Plant**

  Topic: 'Solid Waste Management, Bhandup'
  Resource Person: Faculty Members of Department of Microbiology
  Audience: SYBSc Microbiology
  Date: 20th Jan. 2016

- **Solid Waste Management**

  Topic: 'Solid Waste Management'
  Resource Person: Ms Priyanka Sarcar, Sampurn(e)arth Environment Solutions Private Limited (SESPL)
  Audience: TYBSc Environmental Science(Botany, Geology, Life Science, Microbiology, Zoology)
  Date: 4th Jan. 2016

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XAVIER'S ENVIRONMENTAL COMMITTEE (XEC)

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In today's era, it has become absolutely vital that all stakeholders of an institution be ecologically responsible. The Xavier's Environmental Committee (XEC) was instituted in November 2019 as a staff-student initiative that aims to make the campus more sustainable by ensuring that the environmental impact of college activities are kept to a minimum.

To this end, the major task of XEC was to conduct an assessment of the college campus. It conducted student-led **Environmental Audits** in the areas of Waste Management, Energy, Sanitation and Health, Water Management and Botany. The findings and analysis of the results were compiled in a comprehensive Audit Report that will serve as an important reference point for future improvements within the college.

The XEC organised various events and campaigns to raise environmental awareness and to recruit student members of the XEC.A notice board was put up in the college foyer called the '**XEC Foyer Board**'. This ensured all XEC related notices were effectively conveyed to students of every department and every class when they visited the canteen in their free time. This maximized outreach and visibility. The board contains information about current and upcoming activities, charts and statistics regarding the current levels of waste production on campus and its approximate impact on the environment. An art installation was also attached to the board, that involved a mirror placed at eye-length for passerby's with writing in a striking red colour over it, which said '*Change begins with you*'. The third segment of the board had an informative poster about Multi Layered Plastics what they are, and why they are harmful to the environment. Beneath the poster which was also illustrated with examples of MLPs, was a large bin attached to the board for people to dispose off their MLPs. The foyer board was set up by the Public Relations and Awareness team around the time of the initiation of the Xavier's Environmental Committee, and it was maintained for the remainder of the academic year till March 2020, with weekly updates of the statistics.

A **Panel Discussion** on 'Careers in Environmental and Social Development' was arranged on 11th December. 2019. The objective was to encourage students to follow less common career paths and be inspired by the remarkable work done in environmental/social activism by the panelists - Dr. Agnelo Menezes, Dr. Binoj Kutty, Dr. Manasi Kanuga, Mr. Sunetro Ghosal and Mr. Rishi Agarwal.

On13th December2019, the XEC organised a **Foyer Clean-up Drive**. A group of 10 student volunteers along with the XEC team did a thorough cleaning of the tables, desks and the floor of the foyer using industrial cleaners. Principal Dr Rajendra Shinde and a number of staff members also joined the effort. The tables were entirely scrubbed clean of leftover dried food, bird excreta, and paint. There was a visible difference in the cleanliness of the foyer as noticed by the students for the next week, and the XEC received a lot of praise for this initiative.

XEC identified that waste production as one of the largest sources of lack of sustainability on the college campus. To counter this, they created a **new waste segregation campaign** which involved creating comprehensive, illustrated and **detailed posters** to put at eye-level above

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the waste bins for wet and dry waste bins, along with an **impactful video** created to be played in the audio-visual rooms (Multi-Media Room- MMR and Smith Centre for Audio-Visual Instruction- SCAVI). The video comprised of information about the impact and necessity of waste segregation and the need for waste reduction and less plastic usage. The creatives that were designed for the same were also kept on display on televisions that display current events in college and these are kept on display across the campus, this was done to increase outreach and visibility for students. Throughout the year, these posters were displayed in most frequented places to inform the campus population about waste segregation and sanitation etiquette.

Given that in a college setting, 'another lecture' is the last thing students want to hear, the XEC team chose instead to make the 'desk' a place where people could play games and stress bust rather than learn in the traditional manner. A **Bake Sale** was organised in the foyer on 23rd January 2020. The XEC set up a stall with a simple ring toss game but with the additional challenge of using the right coloured rings for the right type of waste (wet, dry and plastic waste). This not only challenged the players but also brought something ordinarily at the back of one's mind to conscious thinking, which is the goal of XEC - to increase environmental consciousness. The stall also had a sign-up sheet for any future volunteers and a suggestion and feedback board for students to opine on the activities of the Xavier's Environmental Committee.

Additionally, an **E-waste bin** was set up in March 2020 to further optimize waste management in college. The reason this initiative was taken up was because a large number of festivals and events that take place organised by students, for which there is always a 'Technology' department which is in charge of all the equipment used for these events. A large amount of equipment that is old and eventually not usable, along with waste and discharged batteries are generated. Additionally, the constant replacement of cell phones and tablets amongst students, leads to a large amount of e-waste being generated. The college e-waste bin can facilitate the proper disposal of these items. The XEC had plans to tie up with NGOs dealing with the safe and correct disposal of e-waste. However this initiative could not take off as planned as the pandemic lockdown was imposed immediately after.

While planning 'Campus Fests', sustainability is a crucial element often overlooked. XEC conducted a series of meetings with the representatives of the various campus festivals and college student organisations, to develop the **Campus Festival Waste Management Guidelines**. A detailed document was created, containing guidelines and recommendations regarding waste management and waste reduction, energy usage, sanitation and the division of responsibility between Fest organizers and the XEC team with respect to waste segregation. Indian Music Group's 2-day concert - Janfest 2020 – was the first successful trial of a 'Zero Waste Fest' on campus. Almost all the waste generated over the two days was recycled, made possible by an intensive waste segregation plan. This was the first time such

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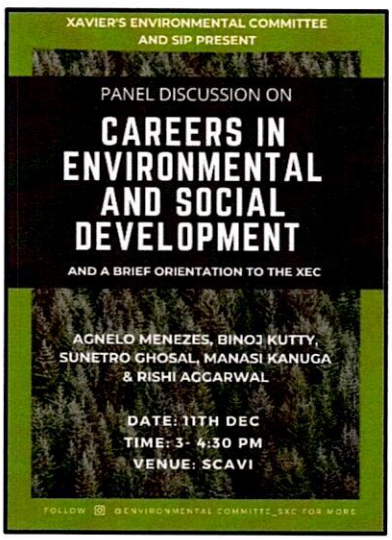
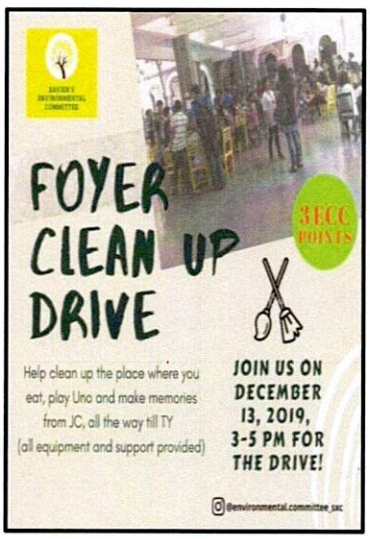
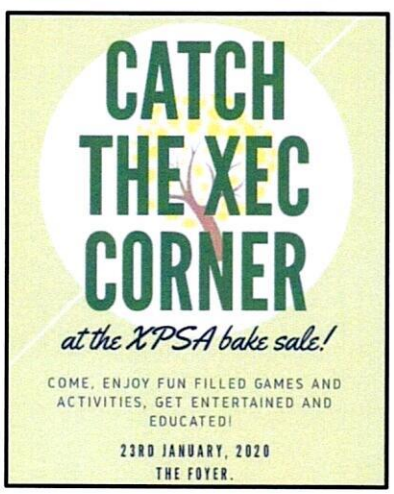
an initiative has been taken up on campus. This will be continued for all events on campus henceforth.







Promotional Posters for various events organized by the XEC

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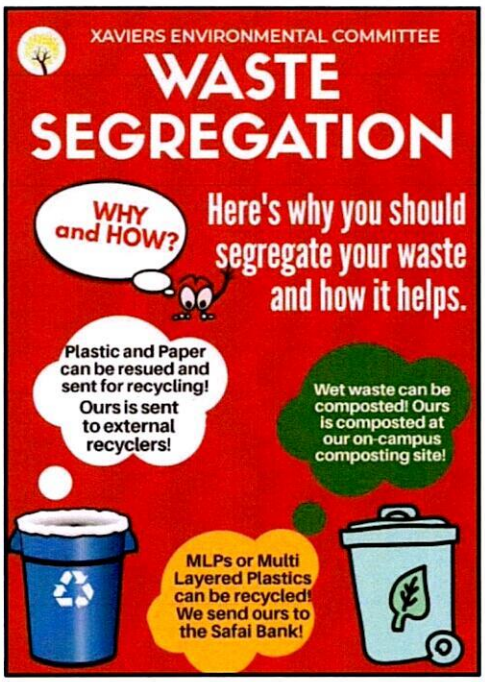

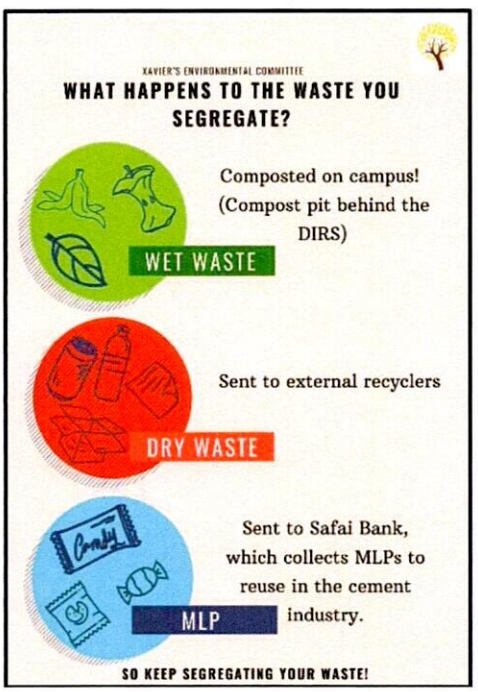

Awareness posters made for Waste Segregation by XEC
These were displayed at prominent locations across the campus and on the digital signages.

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Do–It–Yourself (DIY) Home Composting and Natural Cleaner

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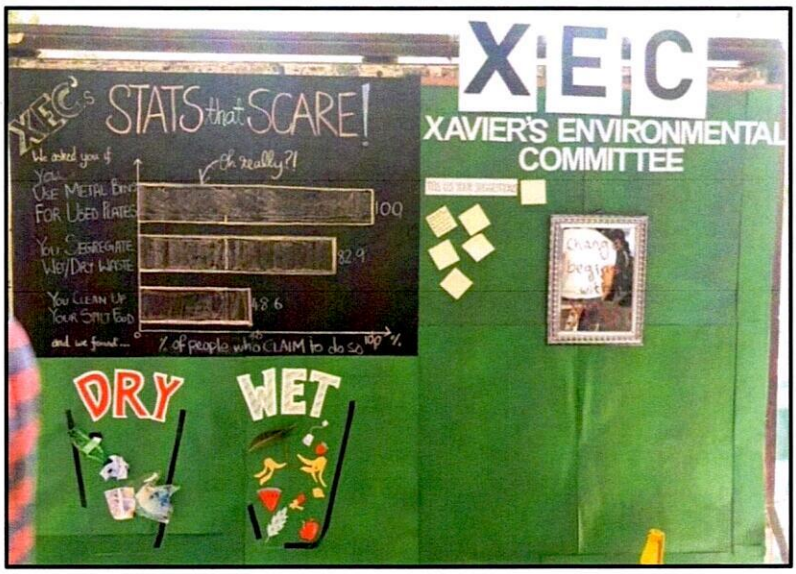

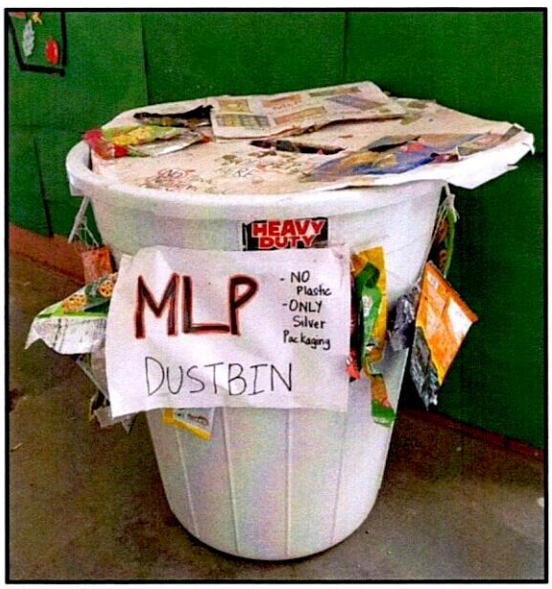

XEC Foyer Board and MLP collection bin (video grabs)

The board contains information about current and upcoming activities, charts and statistics regarding the current levels of waste production on campus and its approximate impact on the environment. An art installation was also attached to the board, that involved a mirror placed at eye-length for passerby's with writing in a striking red colour over it, which said '*Change begins with you*'. The third segment of the board had an informative poster about Multi Layered Plastics (MLP) what they are, and why they are harmful to the environment. Beneath the poster which was also illustrated with examples of MLP, was a large bin attached to the board for people to dispose off their MLP.

Latitude	18° 56' 35.89" N
Longitude	72° 49' 54.10" E

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(AUTONOMOUS)
5, Mahapalika Marg, Mumbai - 400 001,
INDIA.
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XEC team conducting the Waste Audit in college
(Jan. 2020)


Foyer and Canteen Clean-Up by XEC team, student volunteers and staff.
Principal Dr Rajendra Shinde is seen mopping the foyer floor.
(13th Dec. 2019)

Latitude	18° 56' 35.89" N
Longitude	72° 49' 54.10" E

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XEC Panel Discussion on 'Careers in Environmental and Social Development' in SCAVI
(11th Dec. 2019)

Latitude	18° 56' 33.78" N
Longitude	72° 49' 42.79" E

XEC Awareness Campaign in the college Foyer.
The XEC Foyer board and 'Toss for Trash' waste segregation game is displayed.
(23rd Jan. 2020)

Latitude	18° 56' 35.89" N
Longitude	72° 49' 54.10" E

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Our aim is to become a

~~~~'ZERO WASTE CAMPUS'~~~~

Students are actively involved in waste segregation and recycling on the college campus. This handling of a 'real world problem' has made students realize the importance of waste management. They are developing into environmentally conscious and socially responsible young adults. Participating in such activities also helps facilitate the development of their critical thinking and problem solving abilities alongside a lifelong learning.

A short video on our journey to become a 'Zero Waste Campus' can be watched at:
https://youtu.be/xTIpqySHhNY

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