# AMITY UNIVERSITY CHHATTISGARH

Approving University Official(s): Vice-Chancellor-AUC
Responsible Office: Office of the Director Administration
Office of Risk Management Effective date:
Next review date:

# POLICY ON SOLID WASTE MANAGEMENT

## Policy Statement

Amity University Chhattisgarh (AUC) is committed to enhancing the health and wellbeing of its campus community, to increasing safety practices, to reducing consumption of energy and fuels, to minimizing emissions, and to reducing solid and hazardous wastes. Members of the University community are expected to integrate into their daily operations best practices to reduce, reuse, and recycle materials, consistent with Municipal, State, and Central rules and guidelines. This policy applies to the management of various types of generated solid and liquid wastes, as defined below. However, this policy does not apply to the management of domestic sewage, the mixtures of domestic sewage allowable for sanitary disposal, or the management of storm or irrigation water run-off.

## Purpose

Amity University Chhattisgarh (AUC) endeavors to adopt practices that reflect a comprehensive approach to conserving resources and reducing and managing waste. Waste prevention, reuse, recycling, and composting are prioritized over landfill disposal. In order to minimize our environmental footprint; to provide guidance to the University community on best practices for reducing and recycling waste; and to promote adherence to environmental law, this policy establishes a sustainable, solid waste management program that communicates acceptable methods of handling, storing, recycling, and disposing of materials.

## Audience

All members of the AUC community, including students, researchers, faculty, staff, visitors, contractors, and vendors.

## Definitions

*Electronic waste or e-waste*: electronic materials or appliances that are at the end of their useful life. Electronic equipment often contains sensitive data and hazardous materials (lead, chromium, cadmium, mercury, beryllium, nickel, zinc, brominated flame retardants, etc.) whose disposal is regulated. Common electronic appliances include computers,

printers, monitors, microwaves, telephones, televisions, laboratory appliances, and refrigeration units (freezers, refrigerators, and air conditioners).

*Hazardous waste*: any material that

(i) exhibits hazardous characteristics as defined by Central or State law,
(ii) is unusable or unwanted in any way, and
(iii) poses a potential hazard to individuals, the environment, or public health. Hazardous waste includes, but is not limited to, chemical, radioactive, or potentially infectious waste. For a list of examples of hazardous waste and detailed information on its disposal, see the Hazardous Waste Disposal Guide (Central Pollution Control Board).

*Municipal solid waste*: everyday items used and then thrown away, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, and appliances. Municipal solid waste is commonly known as trash or garbage.

*Non-research area*: an area on University property that is not a teaching or research laboratory.

*Specially-regulated waste*: a subset of hazardous waste comprising materials that are subject to specific regulations. Examples include potentially infectious medical waste (PIMW); other biological waste; sharps waste; asbestos waste; regulated polychlorinated biphenyl (PCB) waste; cutting oils and used oil; paint sludge; equipment cleanings; metallic dust sweepings; used solvents from parts cleaners; and off - specification, contaminated, or recalled wholesale or retail products.

*Universal waste*: a category of waste materials designated as hazardous, but containing materials that are common or widely generated in the environment. Universal waste includes batteries, pesticides, lamps, thermostats, and other mercury-containing equipment.

## Policy Implementation

### I. Waste management requirements

A. ***Adherence to applicable law and University procedures***. All members of the AUC community are expected to handle, store, recycle, and dispose of materials in accordance with applicable law and University procedures, including all laws, regulations, and guidance documents referenced in this policy (see "Related Information" below; unless otherwise noted, the versions of such laws, regulations, and procedures currently in effect are to be followed). Specific guidelines relating to different types of waste are identified below.

B. ***Municipal solid waste***. Waste streams such as non-hazardous wastes, recyclables, food wastes, and construction and demolition debris should be handled pursuant to Govt. of India (GoI- CPCB) - Recycling Guidelines.

C. ***Electronic waste***. GoI - law bans most forms of electronic waste from landfills in the state. All University-owned electronic waste will be recycled through Facilities Management's E-Cycling Program and consistent with CPCB - Recycling Guidelines.

D. ***Hazardous waste***. All University-generated hazardous waste must be labeled, handled, stored, and disposed consistent with the Office for Research Safety (ORS) - Guide, developed to ensure that the management and disposal of hazardous waste at AUC is conducted consistent with applicable law, including the Resource Conservation and Recovery Act (RCRA).

Additionally, specially-regulated waste must be labeled, handled, stored, and disposed consistent with any additional applicable laws, regulations, or University guidelines, including the ORS guidelines applicable to the management and disposal of biological/infectious, radioactive, and sharps waste.

E. ***Universal waste***. All University-generated universal waste must be labeled, handled, stored, recycled, and disposed consistent with AUC - Waste Guide.

Any questions regarding the categorization of different types of waste or the guidelines applicable to their management and disposal should be directed to either GoI -CPCB, ORS, or the Ministry of Environmental Health and Safety Management.

**II. Implementation responsibilities**

A. Department and vendor leaders are responsible for:
   i. Reviewing operations to determine where waste can be reduced at its sources of generation;
   ii. Acquiring, to the extent feasible and practicable, items that are durable, have minimal packaging, or are readily recyclable when discarded;
   iii. Assessing purchasing decisions, making every attempt to purchase items only when needed and in amounts that are not excessive;
   iv. Ensuring employees have access to compliant waste containers, including containers for recycling; and
   v. Assuring only trained and certified employees, students, and vendors generate and label specially-regulated or hazardous wastes.

B. AUC faculty, staff, students, and vendor personnel are responsible for:
   i. Separating defined waste types and placing identified waste materials in the appropriate containers; and
   ii. Handling specially-regulated or hazardous wastes only if trained and certified to do so.

C. AUC's Office of Procurement and Payment Services is responsible for:
   i. Prioritizing procurement of goods and services that have a less negative effect on human health and the environment;
   ii. Promoting the purchase of durable and environmentally preferable products and prioritizing these purchases over procurement of single-use or disposable products; and
   iii. Establishing contracts with vendors when necessary to responsibly handle University-generated waste.

D. AUC's Office of Facilities Management is responsible for:
   i. Establishing policies for the management of construction and demolition and executing construction and demolition contracts that include specific construction debris recycling targets;

ii. Facilitating the removal of regulated refrigerants from refrigerators and freezers and maintaining the pertinent records required by law or regulation;
iii. Managing collection areas for the drop-off of universal waste in each building;
iv. Providing standard trash containers; and
v. Maintaining contracts with custodial service providers responsible for collecting non-regulated waste.

E. AUC Administration is responsible for:
i. Managing all activities and services related to municipal solid waste disposal;
ii. Maintaining up-to-date procedures for reuse, recycling, and composting, as well as records of all waste reduction and recycling activities on campus; and
iii. Providing standard recycling containers.

F. AUC's Office for Research Safety (ORS) is responsible for:
i. Maintaining up-to-date procedures and training on the proper disposal of hazardous, radioactive, biological, and potentially infectious wastes generated in teaching or research laboratories;
ii. Providing approved containers for the disposal of hazardous, radioactive, biological, and potentially infectious wastes in teaching or research laboratories; and
iii. Managing contracts for the disposal of all hazardous wastes and for hazardous waste emergency response services.

G. AUC's Office of Risk Management (ORM) is responsible for:
i. Maintaining procedures for the handling and disposal of hazardous and universal waste in non-research areas;
ii. Training all non-research employees handling hazardous waste about proper waste handling procedures, safe use of personal protective equipment, and emergency procedures; and
iii. Ensuring non-research departments follow all contractual hazardous waste and hazardous waste emergency response services requirements.

H. AUC's Office of Human Resources, through its HR Learn system (TCS-ion), serves as a records repository of completion of required trainings for those employed by AUC. For various reasons, ORM or ORS may maintain other training records outside of the HR Learn system (TCS-ion).

## Consequences of Violating this Policy

AUC faculty, students, or staff who fail to comply with the laws, regulations, and ordinances referenced in this policy could be subject to disciplinary action under University policies and procedures, including termination of employment or academic dismissal. The University may terminate its relationship with any third-party contractor who violates this policy. Individuals who knowingly and deliberately release hazardous materials in violation of law could also be subject to criminal penalties.

# Report on
# Sewage treatment being carried out at
# Amity University Chhattisgarh

In most developing economies today, the very factors responsible for economic growth have also, unfortunately, been the root cause of environment degradation. Mass scale industrialization, rapid urban growth, urbanization and rising energy use have taken a grave toll on the eco-system. Therefore, there is dire need for effective environmental management. Waste-water generated by commercial establishments/residential units etc. need to be treated before being discharged into the environment.

Amity University is situated on the NH 9 on Kariyatar – Raipur Marg near Raipur and consists of classrooms, a canteen and hostels. As there is no sewer connection provided by the municipal authorities, the wastewater generated from all these sources needs to be treated before discharging into horticulture or used for flushing. For this purpose, one STP has been installed. A detailed breakup of the wastewater generated and their approx. volumes is listed below.

The technology adopted for treatment of sewage waste is using the Trickling Filter Bio Reactor along with Extended Aeration as primary treatment and an Oxidation Pond as a Tertiary Treatment unit.

**1.2 Treatment system. -** The treatment is based upon Six operations:

1) Sedimentation and sludge maintenance – primary treatment;

2) Inoculation of special microbes;

3) Fixed film filters – secondary treatment;

4) Final settling in a specially designed Tube Settler,

5) Pressure Filtration and finally

6) Polishing in an Oxidation Pond– final treatment.

**1.3 Kinds of waste water**

The Trickling Filter treatment is best suited for waters having fluctuating flows with low settleable solids and narrow COD/BOD ratios. Treatment quality

depends on the nature of influent and temperature. Area requirement depends upon tank height and nature of influent wastewater. The higher the strength of wastewater, the more the volume required. Additionally, we have provided forced aeration using twin lobe rotary blowers along with MBBR media which will further help on reducing the biological oxygen demand and cleaning the waste water.

### 1.4 Special Bacterial Solution – *Aer Bac*

The special microbial solution ***Aer Bac*** consists of a number of species of powerful aerobic microbes which are collected from nature and are not harmful to any form of living organisms. A daily dosage of ***Aer Bac*** helps in maintaining the required microbiological count to treat the continuous inflow of BOD and pathogens. The strength of the raw influent is a major factor determining dosage quantities apart from the strength of the waste water and the retention time available.

### 1.5 Pathogen Control

Pathogens are controlled by the injection of these specially cultivated microorganisms. ***Aer Bac*** synthesizes all harmful microorganisms and allow only the beneficial microbes to grow. This results in controlling foul odour. Microorganisms such as ***Actinomycetes*** produce antibiotic substances that work synergistically with ***Aer Bac*** while restricting growth of the pathogens. Chlorination or other forms of chemical control can be avoided as they not only kill pathogens but also are very harmful to useful bacteria and protozoa that are responsible for ecological balance.

### 1.6 Sludge

Each treatment system produces sludge that must be removed at regular intervals. These may vary from weeks to annually or even several years depending upon treatment method. Aerobic methods produce larger sludge quantities than anaerobic systems. With the addition of ***Aer Bac*** the sludge quantities are further reduced due to increased autolysis. The lower layers of the sludge on the Trickling Filter Media, deprived of nutrition depends upon its own mass for survival. Sludge after drying is reused as compost as it does not contain pathogens. Sludge Drying Beds have been provided for this purpose.

**1.7 The Oxidation Pond: -** An Oxidation Pond has been provided to polish the treated water by allowing further settling to take place and exposure to the Sun’s UV rays to remove pathogens.

## 2 STP: Capacity – 150 cum per day (7.50 cum/hr)

The Sewage water from the Academic Blocks, Boys hostels, Girls hostels, Staff Quarters, Faculty Blocks, toilets and from canteen building is being collected and treated at the STP which is located behind the Boys Hostel. The total flow is approx. 1,50,000 ltrs per day. The treated water is discharged into the Oxidation Pond from where it is being used for irrigation purposes.

### 2.1 Design characteristics:

| Parameters | Inlet Value | Unit | Outlet Value |
|---|---|---|---|
| Flow | 150 | cum per day | 150 |
| $BOD_3$ | 230 | mgs./ltr | < 10 |
| COD | 500 | mgs./ltr | < 30 |
| Total suspended solids | 300 | mgs./ltr | < 30 |
| pH | 6 - 8 | | 6 - 8 |
| Oil & Grease | 2 | mgs./ltr | < 1 |

### 2.2 Design specifications:

| Modules | Volume | Unit | Factor |
|---|---|---|---|
| Raw water sump | 40 | cum | 5 hours |
| Trickling Filter tank | 59 | cum | 8 hours |
| Media Volume | 32.40 | cum | @ 2kg/cum/day |
| Blower capacity | 125 | cum | 37 Kg BOD/day |
| Oxidation Pond | 200 | Cum | >24 hours |

## 2.3 Flow breakup:

| Block No. | No. of Users | Usage /day | Unit | Total Flow |
|---|---|---|---|---|
| Academic Block | 1000 | 30 | Ltrs. | 30,000 |
| Boys Hostel 1 | 250 | 150 | Ltrs. | 37,500 |
| Girls Hostel 1 | 250 | 150 | Ltrs. | 37,500 |
| Staff Quarters | 50 | 150 | Ltrs. | 7,500 |
| Faculty Blocks | 100 | 150 | Ltrs. | 15,000 |
| | | **say** | **Ltrs.** | **1,27,500** |

## 2.4 Bacteria requirement:

| Total Flow | Dosing factor | Bacteria required |
|---|---|---|
| 1,50,000 ltrs/day | 0.001 | 150 ltrs per day |

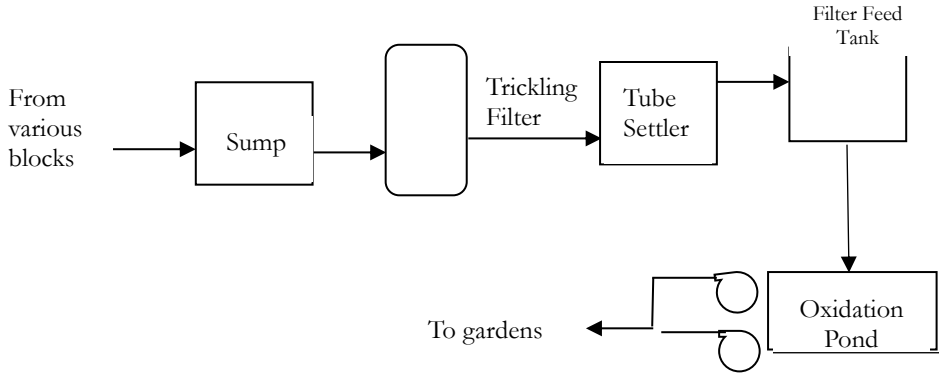
## 2.5 Sludge Handling:

The settle able solids flow into a tube settler where they are allowed to settle and flow into a series of Sludge Drying beds. Here the sludge is dried out and periodically handed over to the gardeners to use as compost in the gardens.

## 2.6 Manpower requirement:

24-hour operation with 3 no's technicians have been provided for uninterrupted treatment and maintenance.

Flow Diagram of STP



ACF Filter

MGF Filter

Bar Screen Chamber

Collection Tank

Airson Blower

Filter Feed Pump

Bio Tower Airson Pump

Sludge Pump

Flushing Pump

Garden Pump

# AMITY UNIVERSITY, CHHATTISGARH

**ESTABLISHED UNDER THE CHHATTISGARH PRIVATE UNIVERSITIES (ESTABLISHMENT AND OPERATION) (AMENDMENT) ACT, 2014 (CHHATTISGARH ACT NO. 13 OF 2014)**

# RAIN WATER HARVESTING AND WATER MANAGEMENT

**Contents**

1.0 Preamble.....3

2.0 Objective .....3

3.0 Applicability & Scope .....3

4.0 Principles.....3

5.0 Elements of RWH.....4

5.1 Catchment Areas.....4

5.2 Conveyance through separate storm water drain .....5

5.3 Surface storage.....6

5.4 Ground Water Recharge.....7

6.0 Quality Monitoring Systems.....7

7.0 Measurement.....7

8.0 Maintenance of RWH system .....7

9.0 Budget.....8

10.0 Review.....8

Fiq.1 Artificial Ground Water Recharge.....9

Fiq.2 Pic of Recharge Pit under construction – AUC.....9

## 1.0 Preamble

Fresh water is turning out to be an increasingly valuable and scarce resource as its demand-supply gap keeps rising at an incredible pace. The availability of both ground and surface water is becoming increasingly difficult owing to the heavy usage for agricultural, industrial and domestic purposes. The recent years have seen a fast-changing regulatory landscape with increasingly stricter regulations on the industrial water consumption. This is an increasing risk to the organisations requiring water as their major input. As a frontrunner in the education industry, Amity University Chhattisgarh (AUC) owes the responsibility to tackle this issue of water availability by reducing its consumption, thus setting new industry benchmarks on one hand and exploring alternate methods to ensure long term water security. Water Policy had been formulated to give direction to such efforts.

Rain water harvesting (RWH) is a way of collecting and storing rain water either for reuse or for ground water recharge. It possesses tremendous potential to reduce fresh water consumption and act as a reliable secondary source of water. AUC shall prioritise surface water storage and reuse over ground water recharge, because

a) Surface storage and reuse is more useful. Ground water recharge is a slow process and majority of water recharged done is not available for intended use subsequently;
b) It will lead to reduction of burden on other water bodies such as rivers, lakes and ground water sources; indirectly contributing to water table improvement;

To strengthen its water conservation initiatives, AUC has developed Rain Water Harvesting Policy which would act as the major guiding document for rain water harvesting. Considering the importance of water as a shared resource, this policy can be further used as a reference for the various water conservation initiatives taken up by AUC and its various projects.

## 2.0 Objective

To promote the installation and periodic upkeep of Rain Water Harvesting system in locations of and near to NTPC establishments.

## 3.0 Applicability & Scope

This policy is applicable to

3.1 All the establishments of AUC thus including projects, stations, administrative offices, hostels, residential quarters and guest houses;

3.2 Locations with and without existing rain water harvesting system;

## 4.0 Principles

This Policy is guided by following principles:

4.1 Rain water harvesting (RWH) system, though functional only for a brief duration in a year, is useful as a secondary source of water;

4.2 Adoption of right combination of superior state-of-the-art technologies and global best practices shall increase the quantity and quality of harvested rainwater;

4.3 Provision of accountability for all locations and mechanism to respond to any aberration from the policy objectives shall yield superior results;

4.4 Promotion of RWH through inclusiveness, capacity building and regular knowledge sharing with concerned stakeholders shall result in capturing of increased quantity of rainfall that would have gone unused otherwise;

## 5.0 Elements of RWH

A RWH system typically consists of following three elements:

a) Collection system or catchment area
b) Conveyance system and
c) Storage/ recharge system with the provision of treatment system, if required

We have to design our system to capture and store all possible rainfall by covering maximum possible catchment areas with optimum storage capacity through extensive networks of conveyance or storm drains

### 5.1 Catchment Areas

5.1.1 It is the first point of contact of rainfall where surface water from rain gets collected, drains towards the common outlet and joins storage tanks, recharge pits, reservoirs etc.

5.1.2 Potential catchment areas for AUC units have been tabulated below

| S. No | Unit | Catchment Area |
|---|---|---|
| 1 | Stations/ Projects | 1. Roof top of all buildings including academic building, Hostels, canteen, parking shed etc.<br>2. Lawns/ Garden Area / Vacant Land<br>3. All the proposed sites.<br>4. Security office, Chiller plant, Sub-station etc.,<br>5. Open areas<br>6. Roads/ Pavement |

5.1.3 Depending on the pollution levels of different catchment areas and quality of collected rainwater, its subsequent use shall vary as illustrated as below:

#### 5.1.3.1 Medium to good quality

**Catchment A**: Rooftop area

The quality of water is quite good and can be used to store locally to meet the washing and flushing requirements of concerned building. Buildings with existing dual plumbing system can integrate this easily.
Excess water can be diverted to ground water recharge with overflow connected to storm water drains to feed into raw water reservoir in plants and/ or to natural drains elsewhere.

**Catchment B:** Hard paved area (Roads)

The quality of water collected from this catchment may be a little inferior to that of catchment A, but better than catchment C. This can be fed into raw water reservoir directly.

**Catchment C**: Landscape/ vacant land area

This category includes storm water from lawns, gardens and open areas. Water collected from these areas contain soil, debris etc. and may need primary level filtration before releasing it into the reservoir

#### 5.1.3.2 Poor quality

**Catchment D**: Areas near to construction sites and sand/dust handling facilities Surface runoff from the such areas/facilities may be contaminated with dust/ash particles. Similarly, areas near to Ash handling facilities will contaminate the storm runoff with ash. The storm water collected from these areas shall be stored and used locally instead of connecting it to storm water drains.

**Catchment E:** Areas with possibility of oil contaminations Rain water collected from areas near to transformers, waste oil storage, drainage near machines etc. should not be connected to storm water drains. They may be connected to ETP drains instead of storm water drains or first treated before connecting it to storm water drains. Rain water collected from rooftop, paved or ground run-off near health centres etc., dealing with Bio-medical waste, shall be designed with utmost safety and hygiene.

### 5.2 Conveyance through separate storm water drain:

All AUC sites/buildings/ projects have created a separate drain system to capture the storm water mainly from the rainfall in the catchment A, B and C. It has been ensured that the sewage water or industrial waste water/waste from labs does not seep into storm water drain resulting into contamination of storm water. Intermediate retention pits are created depending on the topography of the area to hold the storm water and then further pump it to next elevated area. Finally, all the storm water has been diverted to the final holding pond either through gravity or pumping. This water is further treated with some basic filtering mechanism to be finally released into raw water reservoir. Widened and deepened channel with provision of pumping and other necessary arrangements

will be part of holding pond arrangements. Overflow from holding pond will be diverted to natural drains connecting the nearby river bodies such as lakes, rivers etc.

### 5.3 Surface storage

As mentioned above, the collected rain water shall be finally released into raw water reservoir for surface storage, the same shall be facilitated through creation of holding ponds, pump houses and network of pipes according to the need of specific locations.

#### 5.3.1 Site Locations

As rainfall pattern varies from location to location owing to the varied topography, different strategies for water storage have been adopted for different areas. The different establishments have been further classified into the following zones depending on the average annual rainfall data.

**Zone A**: High rainfall area with rainfall more than 1000 mm Rainfall in this area can be a reliable source of water throughout the year. Hence, the focus should be on storing water in the existing raw water reservoir with modifications or through creation of additional storage. The stored water will be used in domestic processes with minimum intake from outside sources.

**Zone B**: Medium rainfall area with rainfall between 500 mm to 1000 mm Such areas will capture less rainfall compared to zone A areas and hence existing reservoir can be modified to the extent which will be able to capture the average rainfall. Additional storage may be created in cases where enough water can be stored for a substantial period of time with good amount of use.

**Zone C**: Low rainfall area with rainfall less than 500 mm These areas will capture less rainfall compared to zone A and zone B and existing reservoir would be able to store the rain water, if any. In all of the above cases, rainfall captured in residential colonies may be diverted to plant for storage and reuse. Also, **additional storage may be preferably created in lowest elevation area subjected to the availability of space**. There shall be a provision of channelling out the excess water beyond storing capacity to outside (natural catchments of nearby river, lakes etc.) to avoid flooding.

#### 5.3.2 AUC Building Locations:

All Locations of AUC buildings have installed rain water harvesting system in the available space through either overhead or underground storage for meeting their daily water requirement especially in rainy season. Also, the catchment area available would be mainly rooftop area and as this water is quite pure, it is stored and filtered for domestic usage. The sizing of storage structure shall be done on the basis of water demand, average annual rainfall, number of rainy days etc.

### 5.4 Ground Water Recharge

Ground water recharge incorporates many factors such as topography, hydro-geology, water table, quality of water etc. There is no benefit of creating artificial ground water recharge system if water table is already high or soil permeability is very less in the concerned area. Central Ground Water Board/State Ground Water Board may be consulted for proper scheme wherever it is mandatory under conditions of Environmental Clearance/Consents.
AUC has at present 05 Artificial Ground Recharge pits in working condition, and 20 more are planned near the proposed sites.

#### 5.4.1 Ground Water Recharge Locations

There is some possibility of contamination from surface and air pollutants, typical from a coal fired power station (AUC is near coal-based power plant), to surface water recharge system. Also, water table may be estimated to be good in high rain fall areas (zone A and B areas). Hence, ground water recharge shall be preferred over surface storage and reuse in AUC residential premises.

#### 5.4.2 Office Locations

AUC owned buildings may consider artificial ground water recharge only or in combination with surface storage and reuse, whichever is suitable to the concerned locations.

## 6.0 Quality Monitoring Systems

Proper quality monitoring system has to be created to regularly check the quality of collected storm water into the holding pond before it is finally released into raw water reservoir. The quality checks shall be done by Chemistry department and by competent authority/ professionals.

## 7.0 Measurement

The rain water harvesting potential of an area can be estimated through the following formula:

**Water captured (L) = Catchment area (m2) X annual average rainfall (mm) X run-off coefficient**
Surface run-off coefficient is a dimensionless parameter and related to the amount of runoff to the amount of precipitation received.

## 8.0 Maintenance of RWH system

Periodic maintenance of rain water harvesting system is mandatory to ensure its functionality resulting into availability of good collected rain water both in terms of quality and quantity.

### 8.1 Catchment

Before the onset of rainy season all the catchment areas A, B & C including the roof of all buildings, roads, vacant lands need to be cleaned thoroughly to remove debris, twigs, plant/tree residues, plastic etc.

8.2 **Conveyance system of pipes and drains**

All pipes/ joints need to checked for any leakages. Storm water drains to be cleaned and freed of silt, sludge, debris etc. to avoid any possibility of obstruction in flow. All drains need to covered with the provision of storm water entrance, to prevent the contamination and any safety hazard.

8.3 **Pumps and electrical systems**

Timely maintenance of various pumps, auto-on/off switches, earthing system etc. to be checked and ensured.

8.4 **Storage and filtering**

All the storage areas need to be cleaned for sludge etc. In case of presence of a filter unit, it has to be regularly cleaned and washed or replaced.

8.5 **Recharge systems**

If there is any recharge system in residential areas, RHQs, offices, the same has to maintained by removing the silt deposited at the bottom of structure.

9.0 **Budget**

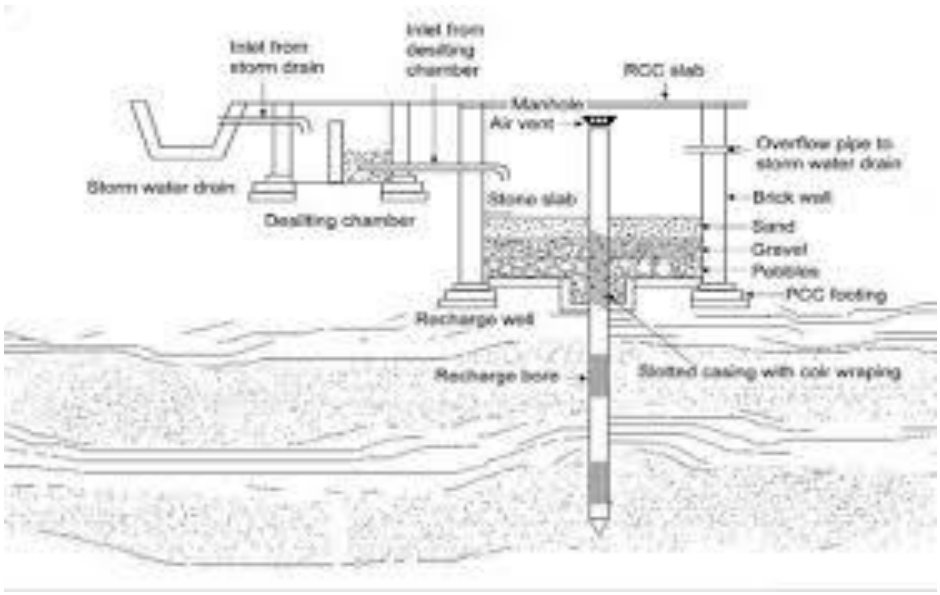
Suitable budget may be allocated for installation and renovation of RWH system at AUC.

10.0 **Review**

10.1 The review of effectiveness of a rainwater harvesting systems in all locations shall be done during water audit annually.

10.2 This policy shall be reviewed at opportune time, but not later than once in three years.

Fiq. 1




Artificial recharge is the process of spreading or impounding water on the land to increase the infiltration through the soil and percolation to the aquifer or of injecting water by wells directly into the aquifer. Surface infiltration systems can be used to recharge unconfined aquifers only. Confined aquifers can be recharged with wells that penetrate the aquifer. Well recharge is also used for unconfined aquifers if suitable land for infiltration systems is not available.

Fiq. 2 Artificial Ground Water Recharging Pit under construction.

Here at Amity University Chhattisgarh 05 such rain harvesting pits are constructed though we have plan of constructing total 25 such Artificial Recharge Systems.

**Project Title: Technical support to Mission Directorate, JJM, PHED in program monitoring of rural drinking water programmes and building capacities of institutions and systems on planning, monitoring and reporting**

**Funded by: UNICEF Chhattisgarh**

**Fund Received: INR 34.47 Lakhs** (QTR-1: 16.86 Lakhs, QTR-2: 17.61 Lakhs)

| | |
|---|---|
| **Location:** | **28 districts of Chhattisgarh and 01 at SPMU, JJM**<br>(14 intensive districts,02 light support districts and 12 additional districts) |
| **Responsible Officer(s):** | **Prof. Surendra N. Rahamatkar**, Director, Amity School of Engg and Technology<br>Assisted by **Prof. Satyendra Patnaik,** Head-CRC |
| **Implementing Partner:** | **Amity University Chhattisgarh (AUC), Raipur** |
| **Project Period:** | **1 June 2021 to 31 July 2022**<br>14 months (Financial support for 12 months) |
| **Project Cost:** | **INR 77,21,000**<br>(INR 69,69,00 funded by UNICEF & INR 7,52,00 (In-Kind Support of AUC)) |

## Background of the Project

The Mission Directorate, Jal Jeevan Mission (JJM), Public Health and Engineering Department (PHED), Government of Chhattisgarh is entrusted with the responsibility of providing safe drinking water and sanitation facilities in rural areas of Chhattisgarh. It is also responsible for planning, implementation and monitoring of centrally sponsored programmes and schemes for safe drinking water in rural habitations of all 28 districts including schools and Anganwadi Centres. This requires dedicated resources and effective management at all districts to deliver high quality outcomes and achieve substantial physical progress.

At present, there is a huge gap in trained human resources for data capturing and reporting on the State's MIS portal. Quality and timely data is essential for the state to track real time physical and financial progress without which large scale water supply schemes cannot be achieved in the state.

**Objectives of the Project (**commencing on 1 June 2021**):** support PHED to strengthen their institutional capacity and program monitoring in 14 + 14 districts of Chhattisgarh by establishment of State Program Management Unit (PSU) at PHED for JJM and 100 days campaign and 14 District Project Management Unit (DPMU) at district level with light touch support to 02 additional districts.

The focus of the activities on two aspects:

**A. Strengthened monitoring and availability of data for planning decision making, reporting and funding**

Establish data monitoring support through District Programme Monitoring Units (DPMUs) with the support of the State Programme Management Unit (SPMU). The DPMU will support the district offices of PHED in regular updation of the scheme's physical and financial progress on the fortnightly basis. SPMU with support of AUC and UNICEF will undertake the following activities to support the districts.

**B. Capacity building for strengthening monitoring systems (including planning, verification, validation and knowledge management)**

Develop and implement detailed capacity building plan based on an institutional assessment that includes training modules for various stakeholders. The agency will identify partners of stakeholders to be trained, who will provide relevant data for reviewing the physical and financial progress of the water supply programmes.

**C. Value added**

- Roll out IOT based monitoring -app supported dashboard for the state
- Social media campaign designed and rolled out for JJM at state and district level (select districts)
- Development of **two research papers / case studies** on how the model has contributed to the institutional capacities and total quality management of PHED in monitoring and reporting

**Based on the success of this**

**PHED -UNICEF-University Partnership Model**, PHED may adopt this approach of engaging technical HR for JJM in partnership with technical institutions and agencies for other important areas.

| **Monitoring support** | **Capacity Building Support** |
|---|---|
| • Develop standardized protocol for data entry, including how to cope with missing data;<br>• Supervise data entry for quality from time to time;<br>• Checking for completeness of data collected and entered on MIS portal; and<br>• Troubleshooting support for districts for frequently occurring technical errors and programmatic glitches.<br>• Establish online and offline feedback mechanism | • Establish teams at district level and assigning roles and responsibilities,<br>• Standardize information flow,<br>• Develop guidelines for validation and verification,<br>• Develop frameworks and protocols for monitoring and evaluation, training needs assessment, capacity building and process evaluation.<br>• Develop IOT based app and dashboard |

## Project Progress Report/achievements on Program Outputs:

14 District Associates deputed in intensive 14 districts along with 14 additional districts with light monitoring support and 01 Project Coordinator at SPMU, PHED deputed to assist and support State and District level functionaries of JJM-PHED on monitoring, Planning and building capacities of institutions on effective implementation of JJM.

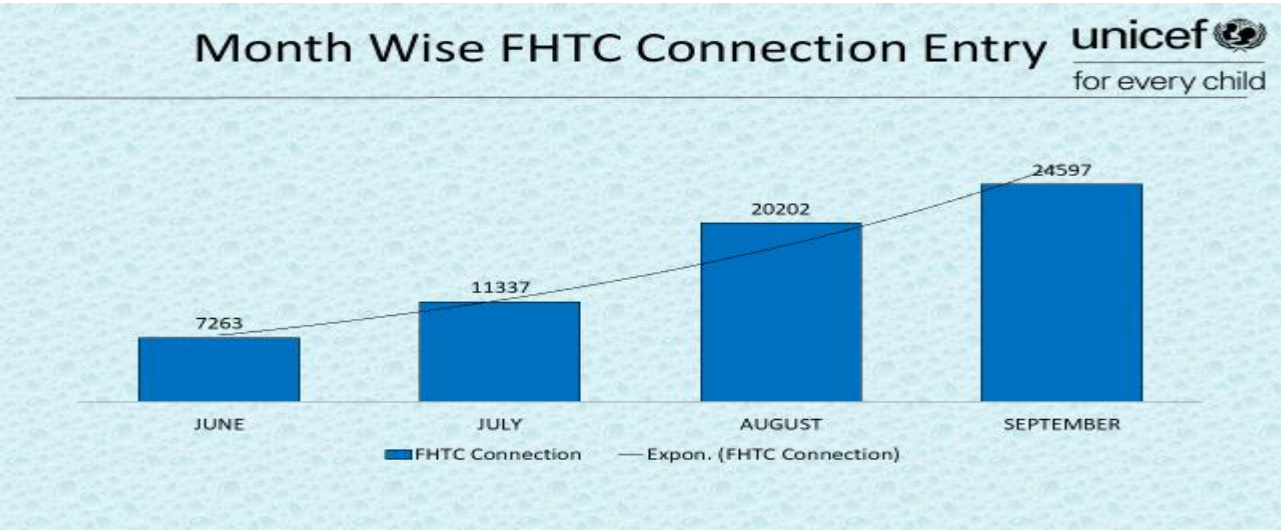
Following Key contributions done by deputed manpower during the First Quarter of the Project duration:

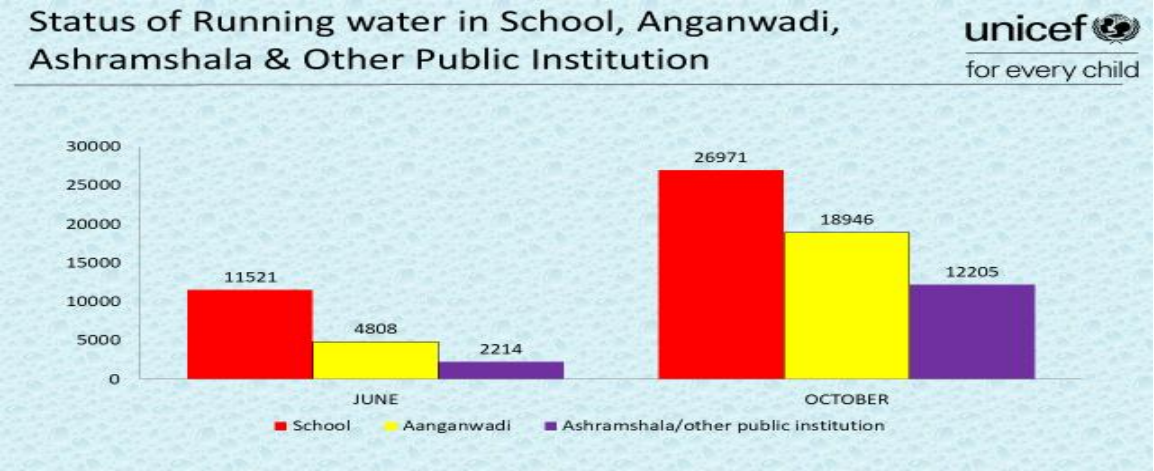
**Program Output 1 :-** Strengthened systemic capacities for monitoring systems in the COVID19 context (including planning, verification, validation and knowledge management)

- Identified and updated missing data of 3824 School data in IMIS portal directory.
- Identified and updated missing data of 3390 Aaganwadi data in IMIS portal directory.
- Identified and updated missing data of 18707 'Aashramshala & other institutions' data in IMIS portal directory.

**Program Output 2:-** Strengthened monitoring and availability of data for planning decision making, reporting and funding in the COVID 19 context

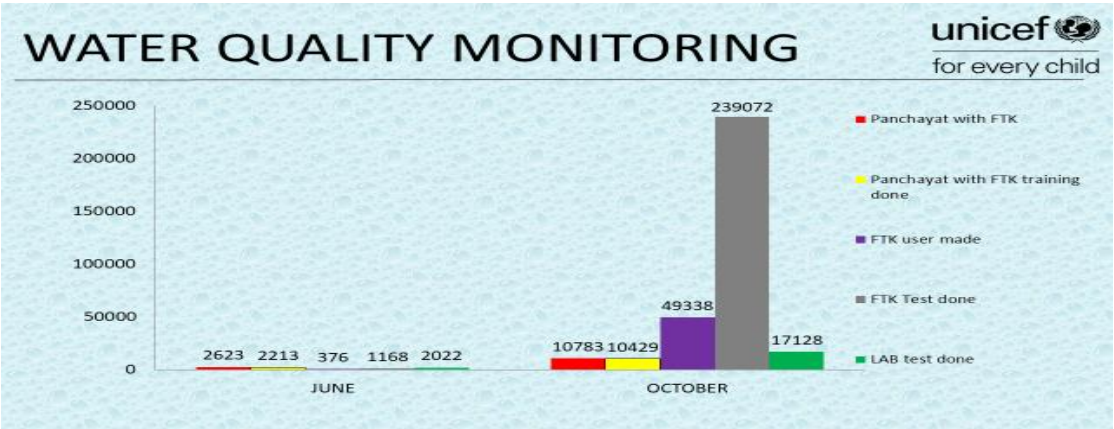
- 61298 Nos provided household tap connections verified and updated in IMIS portal.
- 15450 Nos provided running water tap connection in Schools verified and updated in IMIS portal.
- 14138 Nos provided running water tap connection in Anganwadi verified and updated in IMIS portal.
- 9991 Nos provided running water tap connection in Aashramshala & other institutions verified and updated in IMIS portal.






WATER QUALITY :

- 8160 Panchayats distributed with 'Field Water Testing Kit'.
- 8256 Panchayat done with for 'Field Water Testing' Training
- 48962 Field water test Kit USERs made and uploaded in WQMIS portal.
- 237904 water testing done using Field Testing Kit and uploaded in WQMIS portal.
- 15103 Lab water test done and uploaded in WQMIS portal.




**Program Output 3 :** Knowledge management and programme effectiveness in the COVID 19 context

TAP CONNECTION

- 13.02% households provided with tap water connection.
- 58.29% Schools provided with running water tap connection.
- 42.02% Aanganwadi provided with running water tap connection
- 51.97% 'Aashramshala & other institutions' provided with running water tap connection

WATER QUALITY

- 92.47% Panchayat equipped with Field Water Testing kit.
- 89.44% Panchayat trained for Field Water Testing using FTK kit.
- 50% Field Water Testing kit USER made.
- 25% Field Water Testing done.
- 20% LAB Water Testing done.

Valued Added Support

SOCIAL MEDIA CAMPAIGN

- Twitter - 29 tweets
- Facebook - 20 posts

HUMAN INTEREST STORY

- 15 stories submitted.

DEVELOPMENT OF JJM ANDROID APP

- AUC has launched National Level Hachathon supported by INCUBATE IND (IT MNC) and also identified AUC Team to coordinate with JJM Team for its effective implementation.

========== XXX ==========

# AMITY UNIVERSITY, CHHATTISGARH

**ESTABLISHED UNDER THE CHHATTISGARH PRIVATE UNIVERSITIES (ESTABLISHMENT AND OPERATION) (AMENDMENT) ACT, 2014 (CHHATTISGARH ACT NO. 13 OF 2014)**

# ACTION PLAN
# TO REDUCE PLASTIC IN CAMPUS

## Going plastic-Free

Now here's a major challenge – a "Plastic-Free Campus". The ubiquitous presence of plastic in our daily lives might make this seem like an impossible task. Furthermore, plastics have played a huge role in technological innovation to do a lot of good for a lot of people. But, DO NOT BE DISCOURAGED! Your target is single-use, disposable plastic… and it's totally doable! Becoming plastic-free is a process that won't happen overnight, so keep in mind these key tips:

1. **Start small**, perhaps with a **Pilot Project**, and build on your successes

2. **Educate yourself** and others on the harms of plastics

3. **Rally support** from all types of stakeholders on the campus

4. **Make a plan** of action! While the implementation will be difficult, we and our peers have the power to reduce plastic pollution!

### What does it mean to go plastic-free?

Plastic has become an almost-unavoidable part of modern everyday life. It's affordable, easy to mass-produce, and ideal for many innovative technologies. Pledging to transition away from disposable plastics is pledging to end the consumption of single-use items destined for a landfill. It can start with an elevated education about the consequences of plastic production and consumption, and a removal of basic products like plastic bottles and bags, plastic film, and other unnecessary product packaging. While plastic alternatives can be costly, the long-term health and environmental benefits of going plastic-free far outweigh the initial monetary costs.

## Navigating the Project

**All campuses are different**: what works at one school may require more attention, more push, or may not work at all, for ours. From the passing of bans that have essentially fallen into students' laps, to initiatives that resulted in unintended consumption of other plastic items. You will find that our University has a specific pace to be followed. Our student group working towards zero waste must explore the kind of attention our institution needs. Ask yourself these questions regarding single-use disposable plastics:

- What do you perceive to be the most concerning issues regarding plastic use on our campus?

- What single-use disposable plastic items are most prevalent on our campus?

- Which "problem" plastics should be a priority target?

- What form of action should we take: a ban, a reduced-price incentive for reusables, or simply more education entailing the consequences of plastic use?

## Seven Reasons to go Plastic-Free

1. Single-use disposable plastics have a **massive carbon footprint**. Whether made from petroleum or plants, plastic manufacturing is not efficient due to the scale of production.
2. Both the production and disposal of single-use plastics often emit massive amounts of dioxins, a highly toxic by-product linked to increased cancer rates and other **human health effects**.

3. **Plastic lasts forever**: Plastic can never be broken down by natural processes; every particle of plastic that has ever been created still exists in a form toxic to all terrestrial and marine life.
4. Plastics can be **challenging to dispose of**. Not all localities have the infrastructure to recycle single-use plastics; thus, many recyclable plastics take up valuable landfill space. When not able to be recycled or landfilled, they are often sent to incinerators, emitting environmental toxins into the atmosphere.
5. Plastic **poisons our food chain**: It is increasingly found in the ocean and guts of marine life, extending to affect the health of human populations who rely on fish and other marine life for food sources.
6. Going plastic-free can **save you money**! Relying on reusable items enables you to avoid constant purchasing of disposable items.
7. Single-use plastic items perpetuate a **wasteful, throw-away culture**. Our society is far too valuable to be thrown away! Brought to you by PLAN and the Plastic Pollution Coalition.

Now that we've got the facts about issues surrounding plastic pollution, we want to help you take action! Among all of the following best practices to becoming plastic-free, we outline:

- **How to navigate our campus and local community infrastructure**
- **Existing initiatives, campaigns, and legislation targeting single-use plastics, and where to find information about plastic-free initiatives near us**
- **How to conduct a Plastic Audit, and use that information to make a plan of action**
- **Alternatives to specific single-use plastic items, and resources for further support!**

## Preparing for Pushback

As mentioned, we may receive pushback about going plastic-free. Be prepared for critics to challenge us with these myths about plastic bag bans and going plastic-free:

**Reusable bags spread bacteria**: Some studies out there try to make the case that reusable bags encourage the spread of infectious disease through harbouring bacteria like E. Coli. The reality is that bacteria is found on EVERYTHING, including single-use plastic bags. If your reusable bag is dirty, give it a wash or wipe it down. It's also good practice to use separate bags for meat and produce.

**Reusable bags are toxic**: Any synthetically made product has the potential to contain unsafe amounts of heavy metals or other toxic compounds. Eco-friendly intentioned products are no exception to this. Likewise, reusable bags are no more likely to be toxic than their disposable counterparts. Navigating this is part of being an informed consumer!

**Banning plastic bags means people will just use disposable paper bags instead**: That is certainly a logical assumption, but paper bags can be the lesser of two evils. They are more easily recyclable AND have the ability to be composted. Oftentimes, bag bans will put charge a small fee onto other disposable bags, so that consumers are still encouraged to bring reusables.

**Charging for single-use bags is just a scam for stores to make money**: Fees applied to single-use bags are used to fund an establishment's procurement of more durable (thus, more expensive) bags to comply with the law. The consumer was never getting single-use bags for free in the first place; the cost of procuring them is often tacked onto the prices of products that the establishment sells.

## Know Your Stuff:

**Campus & Community Infrastructure**

Start big and learn the status of the area surrounding our University in regard to any kind of plastic ban or legislation. This knowledge is a powerful tool in moving our campus to take steps. Once we know, we can act. The second half of this action plan covers who to talk to make change.

# Local Laws and Regulations

As the general public becomes more aware of the dangers of single-use disposable plastics, new legislation is calling for sustainable alternatives. While not always obligated to follow suit, universities and colleges can adopt local regulations or ordinances if the campus population expresses support. These community laws can provide a baseline for new student campaigns, or a final push for on-campus initiatives.

## So where do we find all this information?

There are a variety of resources to consult, including web resources from leaders in the plastic-free movement, to talking with city council representatives. Check out the following web resources to find out if bag bans and other plastic free initiatives exist in our area:

- Chico Bag's "Track the Movement" interactive map
- The National Conference of State Legislation site detailing passed and proposed plastic bans by the State
- The Plastic Bag Ban Report for bans nationally and worldwide
- The Surfrider Foundation
- Social media hashtags: #bagban, #banthebag, #plasticbags, #banthebead, #plasticpollutes, #bringyourown

## Existing Campaigns:

AUC - Administration has banned polystyrene (Styrofoam™) in campus food establishments only to find that dining services had already begun taking steps to phase-out the material on their own accord. Students latched onto this discourse and kept close communication with dining services to consult them on what a polystyrene phase-out would look like. This group (Administration + Student groups from various streams) established a petition committee to draft effective policy language, and delegate the proposal out to individual campus food vendors. It was also helpful to have a community member who worked for World Centric, a company that manufactures compostable to-go ware, as a part of the petition committee to be able to attest to the affordability of compostable alternatives. Student organizers recognized that, had they drafted the proposal alone without input from a variety of campus representatives, they would have faced much more pushback. Ultimately, the combined force of Administration, students and dining hall operations made passing of the ban, and its subsequent implementation, more effective.

### Existing Municipal Ordinances & Bans

City ordinance or District Authorities, prohibits the use of polystyrene to-go containers by all food service operations in Raipur. This is in an effort to reduce plastic debris and avoid the potential health impacts of single-use plastic products. The terms are as follows:

- prohibits the use of polystyrene (Styrofoam™) to-go containers by all establishments serving food in Raipur

- requires food vendors and restaurants to use only compostable or recyclable to-go food service ware

With the infrastructure already in place at the local level, the Amity University Chhattisgarh (AUC) implemented a similar policy mandating all private food vendors leasing space on campus to comply with the city ordinance, resulting in the ban of polystyrene on campus.

# Existing Campus Policy and Operations

If University has limited recycling capacities for recovering single-use plastic items, there is all the more reason to eliminate these items on campus. However, for schools with recycling infrastructure, full blown bans of plastic items may not financially make sense to campus administration because of recycling rebates and other incentives that campus receives. Talk to Procurement Department as well as the department that handles waste management in our campus to determine if any financial incentives drive campus recycling operations. If this is the case for our campus, there are alternatives out there for our campus to mitigate its plastic footprint:

1) Decreasing campus-wide procurement and consumption of non-recyclable plastics

- polystyrene containers could be replaced with another material.

- Make some campus events or student org programs plastic-free.

2) Encouraging **individual behaviour change** for single-use plastic consumption.

3) Increasing **recycling participation** and reducing recycling contamination on campus.

# University (In)Capabilities

AUC has been strategizing to purchase reusable dishware for all eateries on campus. We have even succeeded for one or more locations.

As we've just seen, there are a variety of ways to move towards a plastic-free campus. Existing laws and ordinances may serve to make the switch effortless, or may force us to get creative with our education and outreach efforts. Even if we are able to pursue a solid alternative to single-use plastic products, every alternative will have its own set of complications. For example, compostable products may not be compatible with the composting infrastructure of our campus or surrounding community. Furthermore, these operations might not even exist for us to consider compostable bio-ware as a sustainable plastic alternative.

# Collaborating with Departments on Campus

Whether we are trying to pass a ban on campus, change procurement, or establish a reusables campaign, we will need backing from institutions. Remember to include others on campus who are affected by these initiatives. Some examples of important stakeholders to include in our initiatives are:

- dining service workers or food service provider representative: chefs, servers, cafe managers

- campus waste management service staff

- custodial staff

- procurement department staff

- student groups working for campus change: services groups, environmental groups

- professors, faculty, provosts, department chairs

- community members that may be affected remember, having a signature on a petition from a major campus faculty, agreeing to support our initiative or campaign, can go a long way.

# TAKING ACTION

## Conducting a Plastic Audit

The first step is to conduct a plastic audit. Check out and record the following:

- What plastics are used on campus and where do they come from?
- Which of these items are most frequently used?
- Where are single-use plastics disposed of?
- Who is using single-use disposable plastics on campus?

Plastic audits can be conducted through multiple approaches, and will set the stage for plan of action for a plastic-free campus. No matter which approach we choose, try to be transparent to students and other campus residents about why are we conducting a plastic audit - the sooner we start to educate and outreach the better.

# VISUAL ASSESSMENT

Note and track all single-use plastics we see on campus, from trash receptacle contents, to what cafés and campus vendors are distributing to customers. Observe passers by walking to class: What are students carrying? Coffee cups with plastic lids or iced drink cups? Granola bars in plastic wrappers? A sandwich in a baggie or plastic wrap? While taking records of the plastics we observe, keep these questions in mind:

- What kinds of plastics are being thrown away?

- Roughly, what ratio of these are plastics that can be recycled?

- What/How much of that is material supplied by our campus?

- What/How much is being brought onto campus from outside sources?

- Who is associated with these outside sources and how will we communicate with them?

Observe the contents of vending machines on campus. How many in total are they and where are they located? What kinds of plastics appear in them? Which items have potential alternatives?

# PROCUREMENT INVENTORY

A procurement inventory provides more verifiable data on campus plastic presence and insight into campus procurement practices. This will require communication with campus dining services, cafes and other eateries, and perhaps the procurement department through which these establishments purchase their products. Ask for a purchasing list and note the specifics of all of the single-use plastic products that are purchased, including:

- How much of the item is purchased
- How much the item costs per unit purchased (include shipping!)
- What company produces each product and/or the supply centre from which it is shipped
- What the product is made of and how it is packaged

This information will be useful for calculating any sort of cost-benefit analysis of plastic product alternatives that can be presented to campus administration. After taking an initial procurement inventory, we can further analyse the products that we have recorded by finding out if product vendors provide alternatives, and what the costs of these alternatives are in comparison to the materials that are currently being purchased.

# Formulating A Plan

Once we have conducted a plastic audit identifying the major sources of single-use disposable plastics on your campus, where they come from, and who is using them, follow the steps below to formulate a plan for a plastic-free campus!

# STEP 1: FIND YOUR TARGETS

## Petroleum-Based Products & Bioplastics

There are many products advertised as plastic alternatives that are petroleum-based and still contain plasticizers, and thus pose similar health and environmental effects to traditional plastics. Try and advocate against these single-use items in our plastic-free initiatives. **Bioplastics are composed of "renewable biomass sources,"** like corn or vegetables oils, that are processed into a compound called polylactic acid (labelled as PLA #7). Their composition makes them less fossil-fuel-intensive in production and less hazardous in disposal. However, there is often a huge amount of energy sources put into growing the crops for the production of bioplastics. While bioplastics are designed to be "biodegradable", this term does not guarantee that an item will fully break down in a compost system. Furthermore, the nature of bioplastics' composition interferes with the operations designated for recycling regular plastics. In other words, we cannot mix bioplastics in with recyclables!


If implementing reusables is not feasible for our campus at the moment and we opt for single-use bio-plastics, we suggest using World Centric products. The majority of plant fibre products from World Centric are composed of wheat straw, a by-product of agricultural production that is often thrown away or burned.

## Single-Use Plastics

Freedom from plastic should include all plastic items that would normally be disposed of after one use. This includes (but is not limited to) beverages in plastic bottles, items in plastic wrap or plastic containers, utensils, cups and lids, straws, stirrers, bags, and any disposable polystyrene (Styrofoam) products.

## Beyond Bottles and Bags

Single-use plastic bottles and bags are just the first steps to becoming a plastic-free campus. Future purchases of plastic materials should be avoided, when possible, especially when the products are hard-to-recycle or unable to be recycled. For example, plastic shower curtains cannot be recycled and alternatives should be considered when old ones need to be replaced. Another target to be aware of is products containing plastic microbeads.

"Biodegradable" is not the same thing as "compostable"! If an object is biodegradable, that means that is capable of being decomposed by natural processes. This does NOT necessarily mean that the item will break down in a composting system to be used in a finished compost product. There is no time scale requirement for biodegradation - everything will biodegrade eventually. Compostable means that an item or product will break down completely within a given time. Compostable is a term with set requirements in regards to biodegradability, disintegration, and ecotoxicity:

1) **Biodegradability** - 60-90% will break down in 180 days

2) **Disintegration**- 90% of material will break down into pieces 2 mm or less in diameter

3) **Ecotoxicity**- when product breaks down, it will not leave behind heavy metals that are toxic to the soil above a standard level

Bioplastics and single-use compostable are often viewed as a feasible alternative for campuses who have access to composting operations. However, we encourage campus to abide by the waste hierarchy, to reduce and reuse before creating more waste that must be composted. Single-use compostable items still require resources and energy to be produced, packaged, and transported. Furthermore, many industrial composting facilities are opposed to large amounts of compostable plastics in their material, because the chemical makeup of #7 plastics can interfere with efficient decomposition of other materials

# STEP 1: TARGETS LOCATIONS

While campus eateries are the common source of single-use disposable plastics on campus, there are many other source locations to take into account. Some are prime locations for single-use plastic reduction and some are hot spots of information from where we can continue to spread our message.

## Promotional Areas:

Any place displaying school pride, like the campus bookstore or a sports venue, should also represent our campaign. Talking to campus vendors about selling reusable drinkware, like water bottles and coffee thermos; ask that cashiers and other store staff be trained to first ask customers if they need a plastic bag for their purchase, rather than offering it automatically. Look into the feasibility of installing water bottle filling stations**. Other ideas include**:

- not automatically offering straws for drinks, napkins, and other concessionary products at sporting events

- selling reusable bags at the bookstore with our campus logo

## Residence Halls:

Residence halls are a prime location for targeting a large audience of potential plastic users on campus. In order for this to be successful, students need some means of utilizing plastic alternatives, especially those that already exist within dorm locations. For example, highlight existing water fountains and sinks in the building to sway students from purchasing bottled water.

Resident Advisors (RAs) are usually required to hold a certain number of programmed events each term. These events are a great opportunity to reinforce plastic-free habits and education. Reach out to residence hall staff to plan plastic-free program trainings for RAs at the beginning of each term.

# Departments and Staff:

In addition to students, be sure that other members of campus are aware of plastic-free campus initiatives. If staff and faculty understand the effort to go plastic free, they can pass information onto students and campus visitors. Probably Plastic-free efforts can be incorporated into staff meetings, office operations, and class instruction so that these habits become a part of campus culture.

# Events:

Events are a fun and inclusive way of extending the university's plastic-free initiatives to a larger audience. Events provide opportunities to:

- Recruit new volunteers and student groups to join in plastic-free initiatives

- Frame initiatives in a positive light, through fun and interactive activities

- Extend initiatives beyond everyday campus operations

- Advertise incentive programs that give discounts for bringing your own reusable items

Work with event planners to brainstorm procurement alternatives to purchasing single-use plastic materials and supplies. Brand these events as plastic-free in your invites, and make it explicit at the event itself. Connect with student clubs, groups and individuals coordinating events so they can join in and help cultivate a plastic-free culture.

# Pre-Planning:

- Coordinate plastic-free purchasing by communicating with the caterer or food service provider that there should be no single-use plastic packaging for the food
- Buy in bulk or opt for food and materials that are packaged in paper, as long as we have the ability to compost or recycle the material
- Serve beverages fountain-style or out of out pitchers
- Provide reusable cutlery and serving utensils
- Opt for reusable decorations, like cloth table covers or woven placemats, or consult the art or theatre department for old set pieces (any plastic decor should be reused for future events)
- In our event invites, encourage guests to bring their own reusable water bottles and coffee mugs - if it is a picnic type event, attendees can even bring their own plates, bowls and utensils!

# During:

- Set up clear signage for refillable water stations, water fountains, and waste bins
- Use fun displays to advertise the event as plastic-free

- Have interactive games around the plastic-free movement, with reusable prizes!
- Monitor bins throughout the event to ensure waste streams are properly separated (i.e. compost, recyclables, landfill trash). We like to refer to this job as “Trash Talkers”
- Train event staff to talk about plastic-free and the sorting of material in an encouraging way – they should not feel like they are educating, rather than policing

# Clean-Up:

- Do a final sweep of bins to ensure waste streams are properly separated (i.e., compost, recyclables, landfill trash)
- Follow up on our material. Make sure each bin is picked up/ dropped off in the proper location in a timely manner after the event
- Recycle or reuse any plastic that did end up at the event, such as cellophane on catered food or plastic bags from an outside vendor. All of this has the potential to be washed and reused for future events!
- Debrief with our team and the event organizers to assess what went well and what could be improved

# NEXT STEPS:

# ALTERNATIVES TO SINGLE-USE PLASTICS

First, we talk about Education. If people know the problem with plastics, they will be a lot more likely to assist and accept the change. Refusal is next, addressing those pesky disposable items so common at to-go eateries. Our next mission is to replace those single-use plastic items with – and encourage the use of – reusable items. We cover bottles and fountains, bags, dishware and reusable containers, cutlery and vending machines, finishing up with an analysis of different styles of positive and negative reinforcement. Thinking longer term, we go on to discuss procurement policies for campus-wide change. Finally, cross-disciplinary alternatives acknowledge that a Zero Waste campus must be a plastic-free campus.

# 1. Education as an Alternative

Transitioning our campus to becoming free of single-use disposable plastics requires tangible and trackable goals. Keep in mind that many of our successes might take qualitative forms, and may be hard to measure. There may be too much pushback from our campus to officially ban single-use plastics; if this is the case, all is not lost! We can still EDUCATE the student body on the dangers of plastics, and their ability to make a direct positive impact by choosing to live their personal lives without them. For example, the dining hall may still give out straws but that doesn't mean people have to take them. When students are given the ability to choose, rather than having behaviour dictated to them, they feel more empowered! Furthermore, with the ability to choose, students come to better understand the initiatives in place and why they matter… this new attitude is more likely to be sustained beyond their time at the university’

## 2. Refusing Single-Use Items or Providing Upon Request

Dining areas and eateries are prime locations for complementary single-use items making them a primary source for generating waste on campus. Working with these areas can be a huge stride in our plastic-free efforts. Rather than offering napkins, straws, plastic bags, coffee sleeves, and ketchup packets in a free-for-all fashion, eateries can offer these items by request only. Better yet, many of these items can be displayed in a self-serve, bulk fashion.

## 3. Encouraging Reusable Items

Whether or not our campus is able to implement a ban on single-use plastics, It is important to highlight existing infrastructure that assists campus residents in living plastic-free. Post maps and signs around dorms highlighting existing water fountains for students to refill reusable drink containers at no cost. You might also look into making these fountains more reuse-compatible with special gooseneck spouts for more efficient bottle filling. These retrofitted fountains often referred to as "hydration stations" can improve perceptions around drinking free, local water.

## 4. Alternatives Through Procurement

A ban prohibits a product or material from being purchased, sold, or used on campus. Once incorporated into campus policy through a ban, plastic-free initiatives will have more strength and stability. All campus vendors and contractors must abide by the language of the ban; this puts pressure on vendors working with major institutions like AUC campus to create plastic-free alternatives for the greater consumer population.

## 5. Cross-Disciplinary Alternatives

Plastic-free is just one component to overall campus waste reduction. Joining forces with other waste reduction initiatives on campus can strengthen our campaign. A plastic-free campus is by no means mutually exclusive from sustainability initiatives concerning food recovery and hard-to-recycle materials.

## Prioritize Local

Sourcing locally for food and other items reduces the need for extensive packaging, cuts carbon emissions associated with transportation, and allows for more opportunity to negotiate sustainable alternatives with vendors.

## Recycling

An efficient recycling infrastructure is important for managing any plastics that do end up on campus. By recycling plastics, products get a chance to become something else, making it not quite single-use. Try to raise awareness around campus recycling operations participation rates among students. We might make our Plastic Audit a part of a larger campus Waste Audit to gauge all of the different types of waste materials generated on campus and how they are being disposed of.

# Composting

Switching to compostable to-go ware and packaging is a great first step but it must come along with a composting system that can handle not only the material but the volume produced.

# Campaigning

There are a ton of resources both on and beyond campus that we can utilize to spread the word for our project or campaign. Collaborate with our advisor, or equivalent project "champion", about how to reach out to local, regional, national, and international groups who are implementing plastic-free initiatives on a larger scale. Support in all shapes and sizes is important - augment the impact of students in numbers with a shout out from campus staff and faculty, community leaders and organizers, and non-profit advocates!

# Advertise our Campaign!

## Signage and Flyering

- Use different types of font, bolding or underlining important words, to guide the reader's eyes and to break up the text

- Keep it short and simple. Anyone and everyone should be able to get the message with just a quick glance

- Use images to draw attention and help convey information

- Create a memorable logo or slogan for a campaign

- Use numbers on our visual - they can be powerful for putting things into perspective

- Signs should be at eye-level so students can't miss them

- Get help from art and graphic design students!

## Social Media Platforms

Social media is a powerful way to spread the word about our program. We recommend creating a Facebook page and Twitter handle for your plastic-free campaign and projects. Perhaps designate this task to a single person on our campaign team. Work with our Campus Coordinator to utilize PLAN's national media presence in advertising our campaign!

# Making Plastic-Free a Positive Experience

It's really important that the students of our campus leave having had a positive experience with plastic-free initiatives. The goal is not to burden individuals by making it difficult to follow these initiatives. Reducing plastic use is important, and the goal is for students to realize that being plastic-free is possible, easy, affordable, and can be done without missing out on anything.

# Educating Visitors

Educating visitors is not an obstacle, but an opportunity! Chances are that our university rents or donates space to community and private groups for events, such as conferences or summer camps. These visitors are likely unaware of campus plastic policies and initiatives. Work with whomever on our campus maintains communication with these types of groups, such as Admissions, Conference Services, or Orientation Staff, to ensure that the best effort to inform people of our university's policies is communicated before the visit. This also includes educating guest speakers and performers. To make it easier for speakers, performers, and other traveling individuals or groups to comply with our campus policies, offer them advice from the Plastic Pollution Coalition's one-sheet on "Touring Plastic Free", available in the Plastic-Free folder in our Google drive. University tours are another major avenue to convey campus practices. Talk with the department in charge of campus tours about training orientation guides to be able to effectively explain the plastic-free initiatives our campus has adopted.

# Maintaining the Importance of Recycling

Recall any waste or plastic audits we performed in the beginning stages of our project or campaign. We may have found that a lot of students throw away recyclable materials. This often happens with lack of education regarding recycling infrastructure on campus. It might also be caused by inadequate recycling infrastructure to begin with: if recycling bins are not in close-enough range to a trash can, some people may not make the extra effort to distinguish where they are throwing away their waste.

Going plastic-free won't happen all at once, so continue to give attention to recycling infrastructure and participation on campus. Be sure that bins for all different waste streams are present at disposal areas, and are clearly marked and distinguishable. We also may have found in our audit that there is a significant amount of plastic from off-campus sources. It is important to continue education of proper disposal of these items, as they will inevitably enter campus from time to time.

Finally, being plastic-free does not mean disregarding recycling entirely. Even with a reduction of single-use plastics, recycling can still serve as an appropriate disposal method for glass, aluminium and more difficult to dispose of plastic products.