



WOW (Wellbeing out of Waste) An ITC Initiative

A study of preliminary solid waste management mechanism

St. Aloysius Degree College, Cox Town, Bangalore

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What is a Solid waste management process mapping and audit?

Solid-waste management is the collecting, treating, and disposing of solid material that is discarded because it has served its purpose or is no longer useful. The primary goal of solid waste management is reducing and eliminating adverse impacts of waste materials on human health and the environment to support economic development and superior quality of life. This is to be done in the most efficient manner possible, to keep costs low and prevent waste build up.

A SWM process mapping and Audit is an exercise where institutions counter the general thinking that all waste is deposited in a landfill. The reality of it is that the waste our world produces is divided up into categories. Conducting and interpreting a waste audit allows for a more thorough understanding of what makes up an organization's complex waste profile. A waste audit is a thought-out process that is used to determine the amount and types of waste produced by an institution. Completing a waste audit will provide valuable information that will benefit the institution in many ways. In this exercise we aim to understand and evaluate the waste disposal strategy adopted by different organizations. Analysis and observations will be purely based on the practices followed by organizations to reduce the risk of unsystematic waste disposal. Reports will be generated with appropriate suggestions to improve the Standards of waste management mechanism of within the inst. The process will help to access the organizational excellence in handling waste and further improve the quality of the process. The report will provide suggestions to the institutions based on the Current practices adopted to manage the accumulated waste. The study will help institutions to improve the standards of waste disposal in their campuses.

Background of ITC wow – Green Campus Initiatives

ITC WOW (Wellbeing out of Waste) – Initiative of ITC Limited started in 2007 in Hyderabad and in 2013 started in Bengaluru with an objective to inculcate the habit of source segregation among the citizens, to prevent the dry recyclable waste and wet waste going in to landfill and make it available for recycling and composting respectively, conserve natural resources and empower the waste collectors and rag pickers.

We have implemented WOW program in 7 States including Karnataka, Delhi, Bihar, Andhra Pradesh, Telangana, Chennai, and Kerala. We have outreached about 4 million Households, 5000 Corporate Offices, 10K Schools and Colleges pan India. We are preventing 75000+MT of dry waste viz., Paper, Plastic, Metal, etc, every year going into landfills and working with 16000+ waste collectors and rag-pickers, 190 Social Entrepreneurs, 4.8 million Students and 11 million Citizens.

"The ITC WOW - GREEN CAMPUS INITIATIVES is a strategic partnership with educational institutions to jointly build an effective solid waste management eco system through intensive awareness programs and establishing efficient systems to supports on campus source segregation and recycling"

ITC WOW – Green Campus Initiatives strives to collaborate with educational institutions to

- ▶ To engage in activities with all stakeholders – that promote awareness about source segregation to stimulate behavior change.
- ▶ To establish efficient systems to supports source segregation and recycling.
- ▶ To jointly establish action groups like eco club that takes ownership of ensuring sustainability of the system.

Methodology

A baseline study of the current solid waste management practices with the focus on source segregation and recycling behaviour was conducted in **St. Aloysius Degree College, Sarvagna Nagar, Kadirappa Rd, Cox Town, Bangalore, Karnataka 560005 on the 26th August 2022** by ITC WOW – Green Campus Initiative. The study was conducted in and around the campus premises, indoor, outdoor and canteen. For this study, a combination of quantitative method and qualitative method of research was adopted. A quantitative study is a systematic investigation of phenomena by gathering quantifiable data and performing statistical, mathematical, or computational techniques. In this context the study aims at collecting information from existing practices by using a questionnaire to capture the results that can be depicted in the form of numerical. Qualitative research relies on data obtained by the researcher from first hand observation, interviews, questionnaires, focus groups, participant-observation, recordings made in natural settings, documents, and artefacts etc. The data gathered are generally non numerical. As an investigative instrument, questionnaires are the most commonly used quantitative (close ended questions) and qualitative (mostly open ended questions) methods of research. It is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent. The questionnaire used was a combination of close-ended questions and open-ended questions. Open-ended, long-form questions offer the respondent the ability to elaborate on their thoughts. This was done to ensure that the respondents could elaborate on their thoughts and on some indicators we wanted specific response and hence close-ended questions were the primary choice. This helped us in generating data that is easy to analyze and spot trends.

After careful understanding of the numbers the current practices were understood and a process map is drawn out. A process map is a business tool made to evaluating processes. Simply put, as-is maps where your processes are and to-be maps where you want them to be. The as-is phase outlines the current state of your processes and any gaps or issues with the current mode of operation. This would help in making responsible changes to the process of solid waste management accordingly.

Findings and observations

A preliminary solid waste collection and disposal mechanism audit was conducted for **St. Aloysius Degree College, Sarvagna Nagar, Kadirappa Rd, Cox Town, Bangalore, Karnataka 560005 on the 26th August 2022**. The objective of the exercise was to conduct a baseline study to map the waste collection and disposal mechanism on the campus.

St. Aloysius Group of Institution in Cox Town Bengaluru was established in the year 2008 offering Pre University, Graduate and Post Graduate Programme. The Degree college has three floors and is one of the most active areas of the entire campus premises having an inflow of 300+ students each day who remains at the institution from 8.00am in the morning. It is a coeducational facility. All the important academic infrastructure is available for the students such as the laboratories, library, well ventilated spacious classrooms. All facilities such as clean washrooms, cafeteria, and sports ground as well. There are several courses such as computer science, commerce, business administration, political science, Journalism, Psychology. etc

It has been observed that there are dustbins in every floor in the corridors for the students to use. All the staff offices have one dustbin each which then goes to the common bins, the first collection point of waste in the organization. The final destination of the waste is in the junkyard at the corner of the sports ground with no segregation, which has been created over the years of dumping the waste from around the campus which is then burnt. The institution has a particular space that has been allocated for the storage of the paper waste such as question paper, answer sheets, bluebooks and the other administrative waste. The campus has one cafeterias run by a vendor and has no segregation at place hence all the waste is disposed in a mixed manner which goes outside the campus and is disposed on the street. The campus area has a huge outdoor premise and a lot of greenery with some segregated dustbins with labels which is waiting for the users to cooperate.

Waste Collection and Disposal - Process Chart

Dry waste is collected daily from the generation points such as the offices, washrooms, corridors and other common areas that are further dumped into the area that has been created over the years of dumping. The area designated for dumping all the waste is in the corner of the sports ground of the institution premise, located a little away from the busy areas of the campus. It has also been seen that the waste that is dumped are in a mixed form which compromises hygiene of that particular area further proving to be a practice which isn't very environmentally sound, the waste which could have been recycled is being mixed with the other waste is losing its recyclable value by burning it which is one of the dangerous and banned way of disposal of waste. The waste that are burnt include: dry waste of all sorts, wet waste such as food waste of garden waste, electronic waste

such as tube lights, hazardous waste such as broken glasses etc which does clearly is an unhealthy practice.

There is no waste collection that happens, hence the burning.



Figure 1 Dry waste collection and Disposal Process

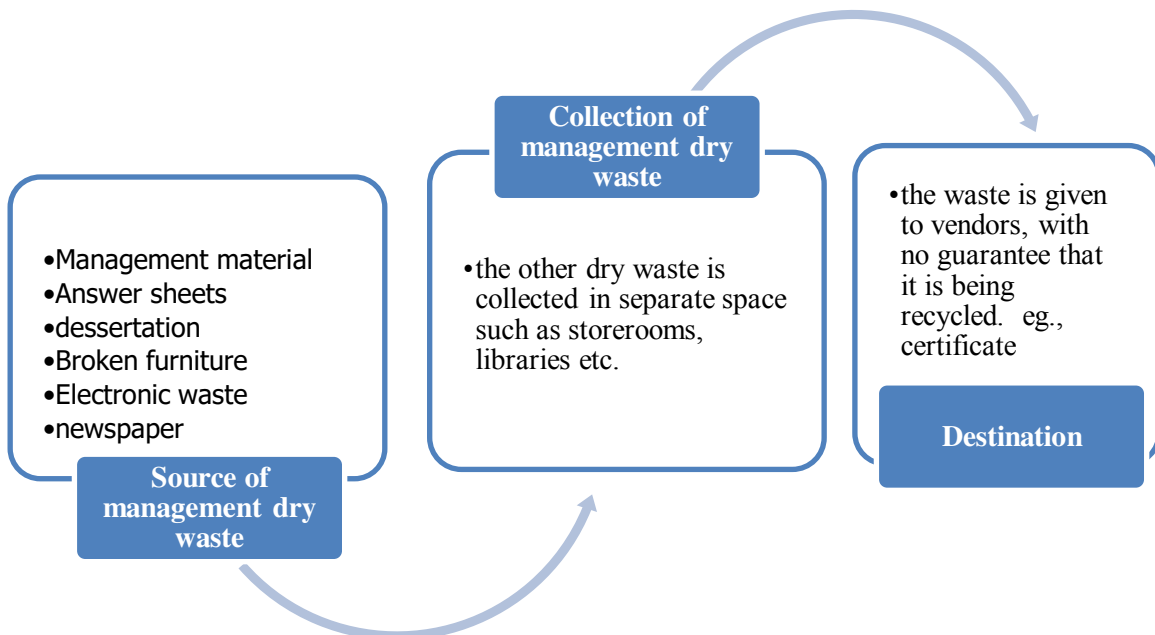


Figure 2 Dry waste (Management Material) collection and Disposal Process

Wet waste is generated from various sources from around the campus such as the corridors, washrooms, classrooms, the cafeteria, cabins. It is currently being generated in a mixed form as there is no practice of segregation of waste at source. All the wet waste is being collected together at the collection point where the housekeeping staff segregates the waste which goes to the dumping yard of the campus and is being burnt. The largest generator of the wet waste is the garden waste since the institution has a huge garden and the cafeteria. The waste from the garden is dried and then burnt along with all sorts of waste including the sanitary waste from the ladies washrooms. As far as the waste from the cafeteria is concerned, it is collected and then thrown outside campus premises such as the roadside dumping with no clear destination. Hence, it is the institutions waste that might be contributing to the creation of black spots.

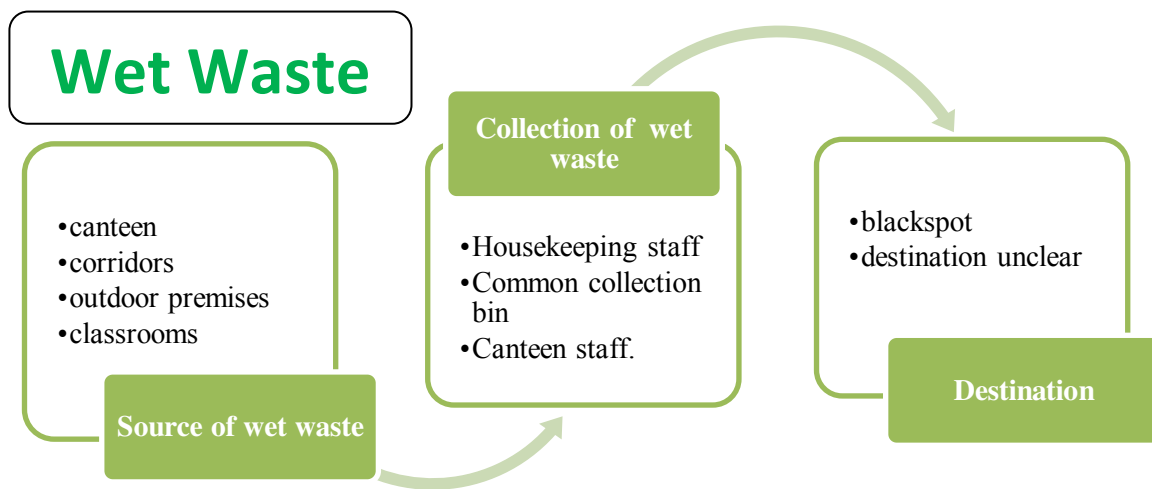


Figure 3 wet waste (Management) collection and disposal process

Sanitary waste is mostly generated from the ladies washroom. Currently the waste is being dumped together at the dumping yard in the campus premise which is then burnt.

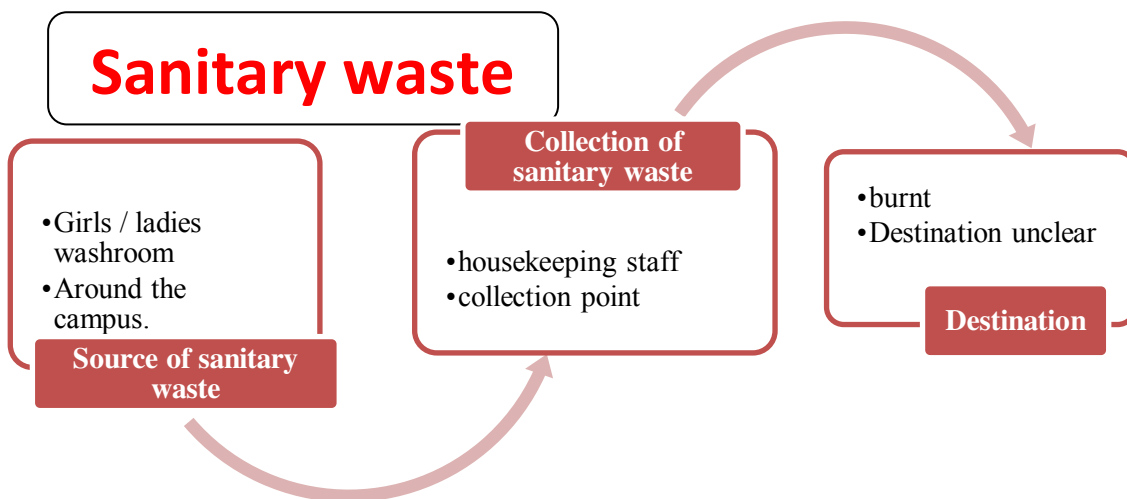


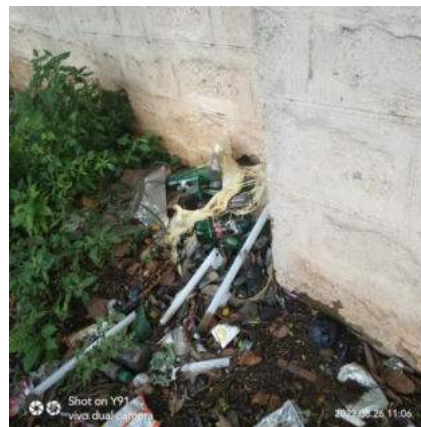
Figure 4 . Sanitary / Hazardous waste collection and disposal process

Master Collection Point

The master collection point is located at the corner of the sports ground. It is seen to be in a very unsystematic manner and is an open dumping yard. All types of waste are being dumped together in the open with no segregation of waste at source being practiced. There is various housekeeping staff who does a portion of segregation but not all, hence a whole lot of waste dumped into the junkyard is currently losing the recyclable value of the waste which would have otherwise been recycled and the value recovered. Instead, the waste is being burnt and that isn't a very environmentally sound manner of waste disposal and can cause harm to the quality of air, further leading to the institution's contribution towards air pollution. All waste including dry, wet, sanitary, hazardous and garden waste is seen in a mixed form.

As far as the management paper materials such as answer booklets, bluebooks, newspapers, administrative documents etc, is concerned, separate spaces are allocated for the storage of the same such as in the library, below the staircase (PG Block), a storage room.

The pictures below shows the nature of waste found in the above mentioned master waste collection space of the campus:



Current Waste collection system

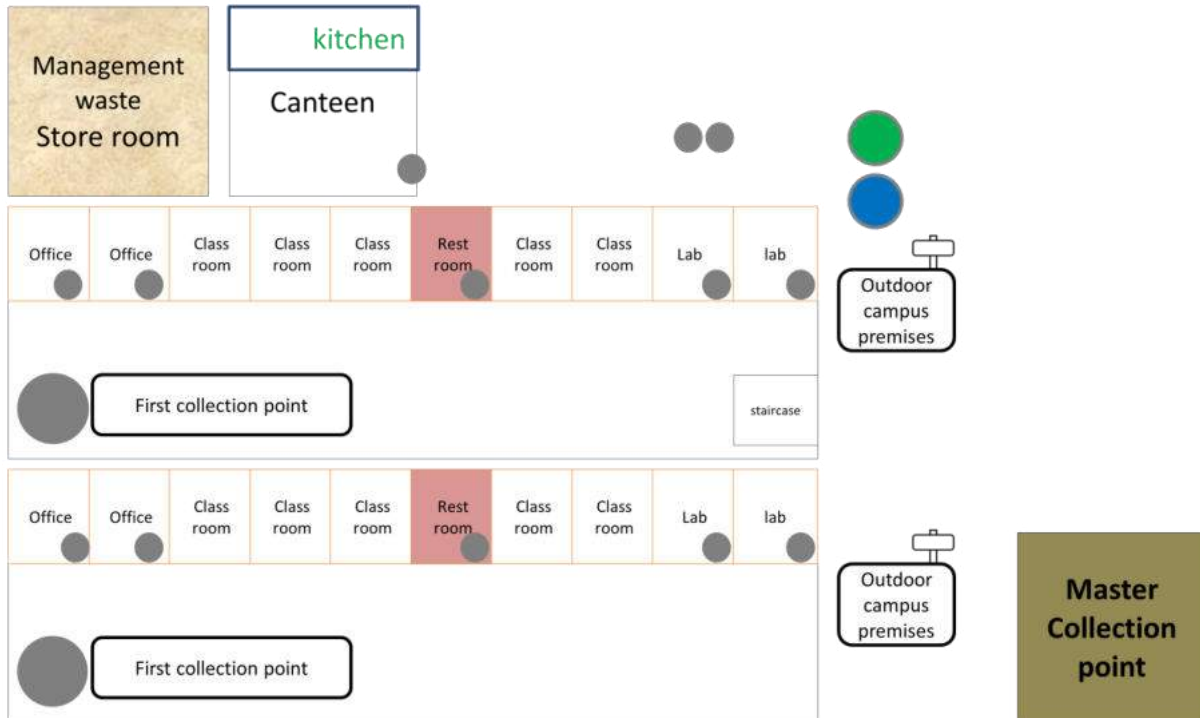


Figure 5 Current Waste Collection System

The Study Parameters and Results

A broad framework of the solid waste management mechanism was prepared around the following indicators. The results would be expressed corresponding to the same as well.

- **Availability of Bins as per SWM Rules**
- **Quality of Waste Disposal practised in the Organisation**
- **Practice and Quality of dry waste processing**
- **Practice and Quality of wet waste processing**
- **Usage of safety equipment by people Handling**

Availability of Bins as per SWM Rules
<ul style="list-style-type: none"> • There is one dustbin each available in the office cabins, corridors, building entrance, washroom. • There is a segregated and labelled bin in the outdoor premises of the campus.

<ul style="list-style-type: none"> • All dustbins in the cabins and the classrooms are made of plastic and is seen without a liner. • Only few of the dustbins are labelled with types of waste (eg. Dry waste, wet waste etc). • Only few of the dustbins are colour coded. • All the dustbins in the corridors and the outdoor premises are covered • There is one bin placed at the cafeteria, and segregation of waste is not being practiced. • There are bins in the washrooms, although the waste is bring disposed off in a mixed form.
<p>Quality of Wet Waste Disposal practised in the institution</p>
<ul style="list-style-type: none"> • The institution does not practice source segregation yet. • The wet and dry waste is combined together and disposed in the junk yard. • The canteen has lined plastic dustbins but there isn't separate dustbins found. • The waste from the cafeteria kitchen goes to the roadside dumpyard.
<p>Practice and Quality of dry waste processing</p>
<ul style="list-style-type: none"> • The dry waste is collected from all the corridors and is not disposed off in a mixed manner but stored in a common space (outdoors and unplanned master collection point) which is later burnt. • The institution has an MoU with a certified recycling organization and is yet to begin the process. • There is a use of paper cups in the cafeteria. • There is single use plastic being used at the cafeteria.
<p>Practice and Quality of hazardous / sanitary waste processing</p>
<ul style="list-style-type: none"> • All waste is being disposed in a mixed form. • The rest of the sanitary waste is also collected by the BBMP trucks while collecting the other waste with no planned schedule. • The hazardous waste disposal mechanisms of the same have not been planned out.
<p>Usage of safety equipment by people Handling</p>
<ul style="list-style-type: none"> • Gloves and masks are not used by the housekeeping staff while cleaning. • The housekeeping staffs clean the institution daily and collects the waste from each collection point such as the corridors, classrooms, washrooms, outdoor premises etc., to the common disposal point of all the waste. • The housekeeping staff burns the waste as the final part of the disposal process of the waste generated from the institution.

Suggested Waste collection system

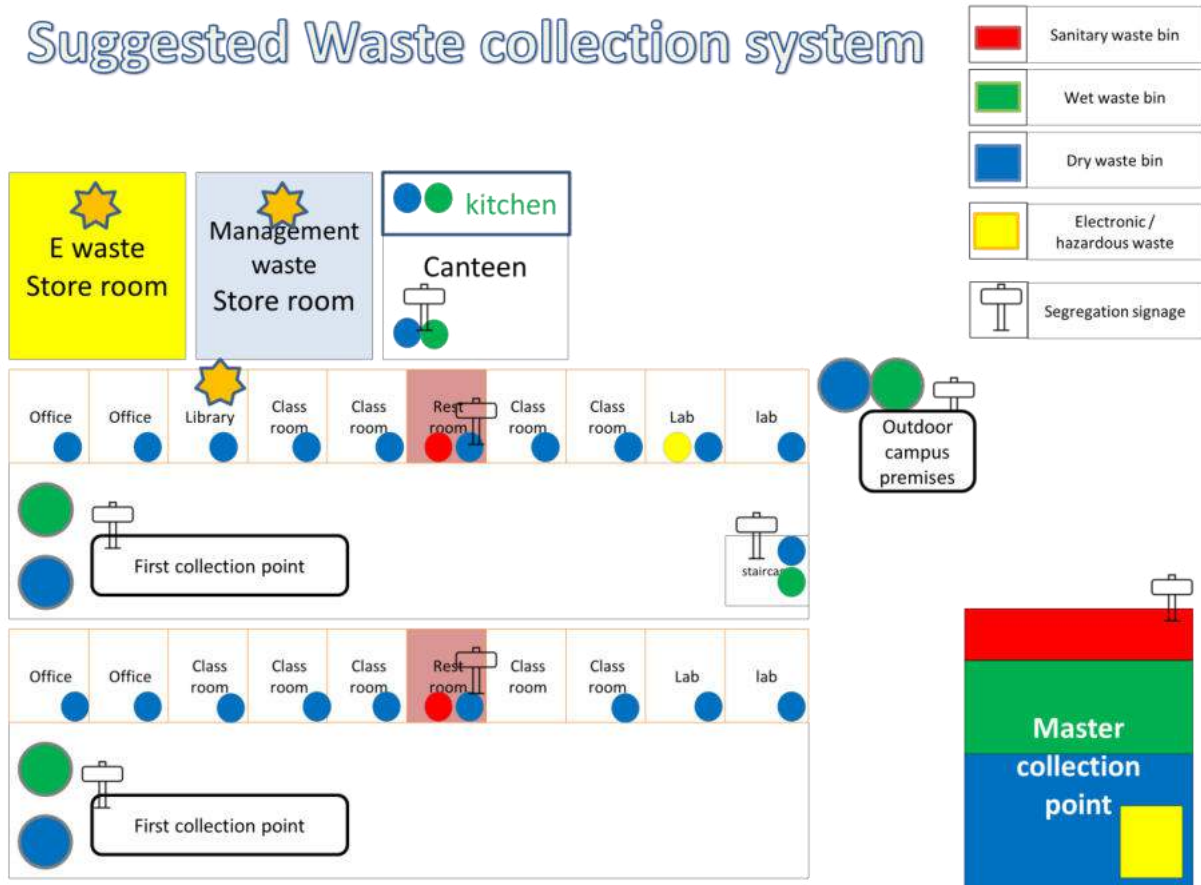


Figure 6 Suggested Waste Collection system

The recommendation made by ITC WOW – Green Campus Initiatives

Mechanisms to ensure source segregation and recycling behaviour

Overall Availability of Bins and disposal

- There should be colour coded and separate dustbins for **DRY, WET** within the campus such as the, **canteen, corridors /staircase**.
- There should be two bins in each washrooms with specific bin: **labelled or blue for Dry waste and labelled or red HAZARDOUS / SANITARY waste**
- There must be **basic and clear** waste management **signage** in the campus at **crucial points** (the template is shared above such as **Wet waste, dry waste, sanitary waste**, etc) in languages that are most prevalent in the campus.
- The all the dustbins should be colour coded or labelled (in languages that are most prevalent in the campus such as English, Kannada etc) for ease of segregation by the users:

Green - wet waste (food waste) / biodegradable waste.

Blue - dry waste (plastic, glass, metal, paper etc)

RED - bio hazard waste / sanitary waste / hazardous (sanitary napkins, used cotton, medicines, dead rodents and cockroaches, paint waste etc.)

Quality of waste disposal practised in the organization

- The waste collection space in the campus ground corner should have a separate shed like structure for **dry waste** (a separate room with no windows or anything that allows moisture / water seepage). Or big segregated bins for waste accumulation and storing. A bin / Box can be allocated within the dry waste collection place for storing the **hazardous waste**.
- A separate room / big dustbins for the **wet waste** with proper ventilation for air circulation, likewise a separate space for **sanitary / biomedical waste** is recommended.
- As far as the labels and the colour code for the bins is concerned, the institution may follow the following:
 - **Blue bins - lined with plastic or reusable HDPE sacks for dry waste**
 - **Green - lined with newspaper (no plastic garbage bags) for wet waste / or just bins which can be rinsed once cleared for hygienic purpose.**
 - **RED - Lined with plastic for bio medical / sanitary waste.**
- The waste must be handed over to the responsible and authorised/certified waste collectors in a segregated manner, ensuring responsible and environmentally sound disposal of the same.

Practice and quality of dry waste processing

- All dry waste can be stored in a segregated form and given to the authorised/certified waste collectors for collection.
- There must be a separate space allocated for the disposal and collection of the dry waste generated at the campus premises ensuring that all dry waste generated be recycled or responsibly treated post collection as opposed to it reaching the landfills.
- The other forms of dry waste such as the administrative/management materials such as answer sheets, blue books, newspaper, magazines, waste paper, cardboards, accumulated bulk glass and metals, wood, etc should be handed over to authorised / certified / endorsed recyclers.
- The institution should ensure that the institution answer sheets, blue books, records and other confidential paper waste is destroyed by means of shredding so as to maintain confidentiality and proper waste disposal ethics.
- The institution should ensure that the recyclers / scrap dealers will provide recycling certificates.
- All in all, there should be tie ups with credible recyclers for periodic dry waste disposal; this would ensure more responsible recycling and diversion of the waste from the landfills.

Practice and quality of wet waste processing

- The campus has ample space to set up a composting facility.
- The institution can opt for the instalment of the OWC Machine (Organic waste Composting), within the campus for composting and the compost can be used for the garden within the campus.
- One of the largest generators of wet waste from around the campus would be the canteen and it should be a mandate for the segregation of waste to be practiced there.

Practice and quality of sanitary / hazardous and electronic waste processing

- There should be 2 dustbins in all toilets - **blue and red i.e., dry waste and sanitary waste / biomedical waste.**
- **RED** - Lined with plastic for bio medical / sanitary waste. Although the incinerators are installed in the ladies washrooms, there is still waste being disposed into the bins and further to the master collection point, further leading to the contamination of the waste. Hence strict rules should be set for the disposal of sanitary waste.

Waste monitoring

- A documentation of the waste volume can be maintained by means of the same being acquired from the waste collectors to keep track of waste generating patterns so that the institution can devise means of better disposal practices and avoid their waste reaching the landfills.
- Once segregation of waste starts to be practiced by the institution then the documentation process is bound to be efficient since there shall be clarity in terms of the waste generation and its volume of all the different types of waste.
- The institution should ensure that there should be at least one waste review bi-annually or annually.

Innovation

- The institution could involve the NSS units, Eco clubs to maintain check and balances in the system of source segregation and proper waste disposal practices.
- Developing written regulations for the students to follow segregation and the same circulated would be a great step as far as the initiation of the practice of segregation of waste is concerned.

- The same kind of policies / regulations can be schemed for the waste management such as penalty if caught disposing waste in mixed form, handing the waste to only certified vendors etc.

Use of safety equipments by the team handling waste

- All the housekeeping staff is to be provided with safety equipments such as aprons / outer wear (reusable) , gloves, masks etc and ensure that they use it at all times while they carry out the cleaning.

IEC Activities

- Training for the housekeeping staff should be done periodically to ensure system is maintained. They should be trained on the health and hygiene as well. Each housekeeping staff is recommended to use a mask and that they are provided with proper protective gears such as gloves.
- Each student must be notified on the mechanism of waste disposal for further long term maintenance of the segregated bins. Frequent sessions can be carried out to keep the students conscious about their waste generation and disposal patterns and being more mindful in the future.
- The NSS team can ensure carrying out activities so as to engage the students in the process communication and action towards a clean and green surrounding.

The waste generation pattern of the institution could not be studied as the dustbins had been cleared and the daily waste had been disposed.

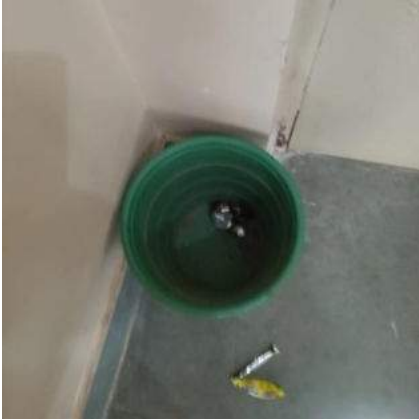
Below are few pictures as example of master collection point:





Few pictures from around the campus premises.







Dustbins from around the campus

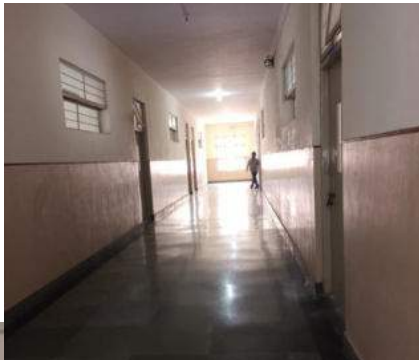




Dumpyard of the institution



Housekeeping staff



Other spaces around the institution

