Waste Audit and Characterisation Study In the Madras School of Social Work

February 2018

Abstract: In February 2018, CAG began an engagement with the Madras School of Social Work (MSSW), an autonomous college located in the city, to make their campus zero waste. This report presents the findings and recommendations from the preliminary waste audit undertaken by the CAG team along with the staff and students of MSSW.

1. Background

The Madras School of Social Work is an autonomous college offering full-time and part-time courses in the fields of professional social work, human resource, psychology, and other related social science disciplines. The college has 750 students enrolled in various programmes and 129 students reside in the hostel on campus. Having learnt of CAG's work on waste, the college approached us to initiate become a model zero-waste campus.

The SWM Rules, 2016 provide clear directions to bulk waste producers (BWPs), like institutions, schools, colleges, gated communities, and markets to manage solid waste. According to the Rules, any entity that generates 100 kg waste per day or has a land area of 5,000 sqm should segregate waste at source and handover recyclable materials to the urban local body or to authorised waste pickers and recyclers. It expressly recommends that BWPs manage biodegradable waste within the premises by means of composting or bio-methanation.

At present, the waste generated in the college is disposed into 80 small-sized receptacles placed in classrooms, staff rooms, and hostel dorms, and ten medium-sized red trolley bins placed on the campus ground. Housekeeping staff clear garbage twice every day in a green dumpster stationed near the hostel block (Image 1). The placement of bins on campus is not planned to reflect this. As a result, the college campus is littered with includes paper cups, single-use juice cups and multilayered plastic laminates (chocolate and chips wrappers).

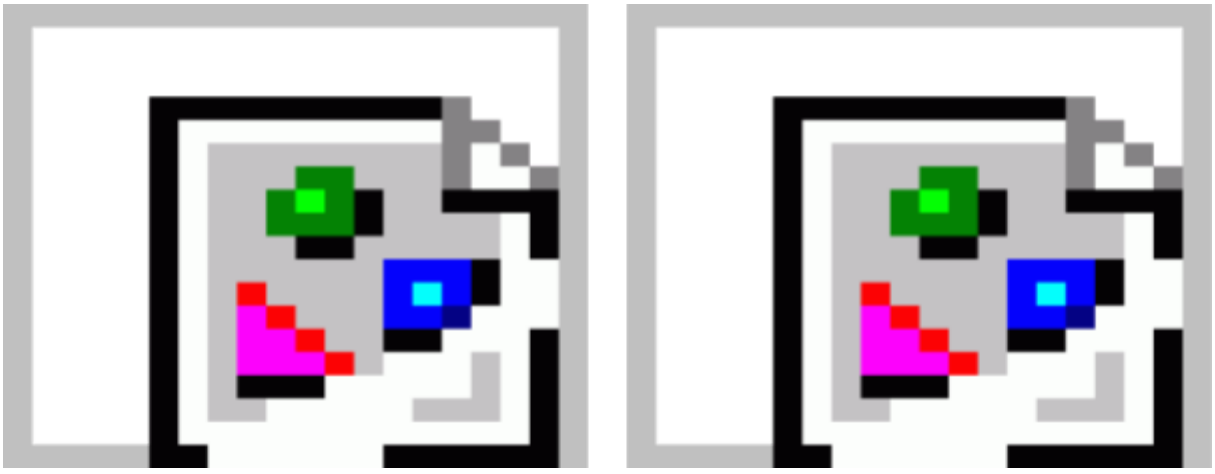

Image 1: Unsegregated waste at the dumpster and litter across the campus

2. Methodology

To study the waste generated in large entities, such as school, colleges, and other bulk waste producers, CAG typically conducts a waste audit over three days. These comprise of two general working days and the third to account for waste produced during weekends, special events, co-curricular and extra-curricular celebrations conducted in schools and colleges. However, in the case of MSSW College, we were able to conduct only a one-day audit.

In the waste audit, we gathered waste generated at different locations in the campus is collected, and sorted it based on the nature of waste into biodegradable and non-biodegradable. The biodegradable waste was further classified into food waste (cooked and uncooked food waste from kitchen and dining) and horticulture waste. The non-biodegradable waste was further classified into:

1. Recyclables: cardboard, paper, newspaper, glass, metal, tin foil, PET bottles, milk packets, stationery plastic.
2. Non-recyclables: paper cups, paper plates, LDPE plastic, Styrofoam, thin film plastic, cloth, tablets and syringes from the weekly medical camps, straw, branded and unbranded multilayer laminates.

We also conducted semi-structured interviews with the housekeeping staff, teaching staff, and students to further understand the factors that influence their waste generation and management practices. Among others, we asked about the food menu, frequency of events on campus, and waste collection and disposal practices.

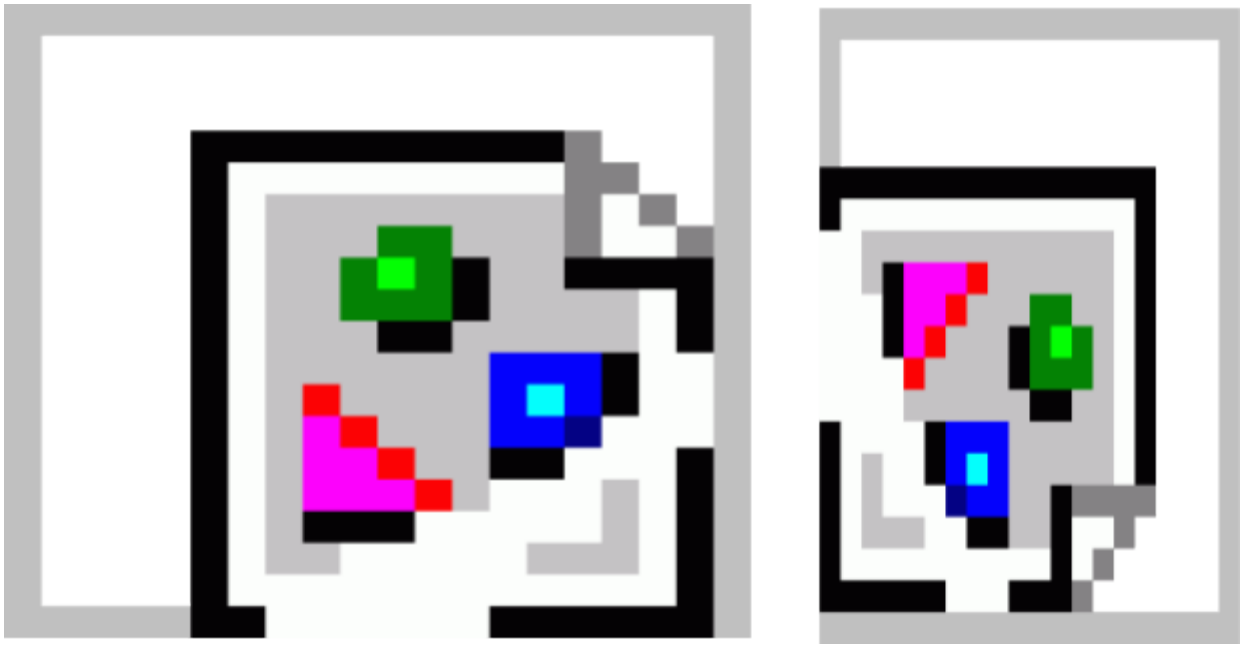

Image 1: Audit being undertaken by students and housekeeping staff

3. Findings

On a regular working day when the food is prepared and served on campus, biodegradable waste was 56% of the total waste of 122 kg. Food waste from the mess and the canteen was 45 kg. Non-biodegradable waste was dominated by recyclable waste such as paper (18 kg), cardboard (6 kg), and PET bottles (3 kg). Out of 18 kg of non-recyclable waste, disposable paper cups alone weighed 3 kg and foil-lined paper plates weighed 2 kg. Multilayered plastic, mostly comprising chocolate and chips wrappers, was also present in large amounts.

We further audited nearly 500 pieces of multi-layer plastic packaging to know the most commonly consumed items on campus. The volunteers segregated the plastic packaging into three common categories: food and beverages, homecare, and personal care. As expected, multilayer packaging for chocolates and candies accounted for the largest number, followed by PET water bottles, and chips.

Image 2: Results of secondary audit of plastic pieces

4. Recommendations

The goal of a zero-waste campus includes a set of processes and practices designed to achieve a net zero environmental impact. Every stakeholder within the college community should participate in the initiative for it to be successful. Data from the audit shed light on the approximate quantum of waste generated in the college. Based on that, we recommend that the college institutionalise the following the primary measures with respect to infrastructure and processes.

1. **Source segregation**: Biodegradable and non-biodegradable waste should be separately collected on a daily basis. The receptacles could be the existing bins painted different colours to be easily distinguishable.
    - **Green for biodegradable waste** – cooked and uncooked food waste, vegetable and fruit peels, leaf plates, used tissue paper
    - **Blue for non-biodegradable waste** - plastic covers, PET bottles, milk packets, metal, glass, cardboard/ corrugated cardboard/ office white papers/ non - white paper/ newspapers/ old books/ magazines
    - **Red for sanitary and hazardous waste** – sanitary pads, napkins, and other hazardous waste.

The bins from each classrooms and staff rooms may be removed and placed at the entrance of every floor. The systematic reduction in the number of bins placed will motivate staff and students to reduce and reuse materials before they are discarded. We propose the following numbers and locations for the bins.

Block ID	Place	Category of waste	Size of bin	Number
Block A	Placement center/ Counselling cell/ Record room	Non-biodegradable waste	Small	1
Block B	Admin room	Non-biodegradable waste	Small	1
Block B	Management rooms (3)	Non-biodegradable waste	Small	3
Block B	Ground floor classrooms (3)	Biodegradable and non-biodegradable	Small	2
Block B	Toilet (M/F)	Sanitary and hazardous	Small	1
Block B	First floor	Biodegradable and non-biodegradable	Small	2
Block B	Staff rooms	Biodegradable and non-biodegradable	Small	2
Block B	Toilet (M/F)	Sanitary and hazardous	Small	1
Block B	Second floor	Biodegradable and non-biodegradable	Small	2
Block B	Staff rooms	Biodegradable and non-biodegradable	Small	2
Block B	Toilet (M/F)	Sanitary and hazardous	Small	1
Block B	Third floor	Biodegradable and non-biodegradable	Small	2
Block B	Staff rooms	Biodegradable and non-biodegradable	Small	2
Block B	Toilet (M/F)	Sanitary and hazardous	Small	1
Block C- Men's hostel	First floor	Biodegradable and non-biodegradable	Small	2
Block C- Men's hostel	Second floor	Biodegradable and non-biodegradable	Small	2
Block C- Women's hostel	First floor	Biodegradable and non-biodegradable	Small	2

Block C-Women's hostel	Second floor	Biodegradable and non-biodegradable	Small	2
Block C	Hostel Mess	Biodegradable and non-biodegradable	Medium	2
Block D	Storeroom	Non-biodegradable	Small	1
Block E	Ground floor	Biodegradable and non-biodegradable	Small	2
Block E	Toilets	Sanitary and hazardous	Small	2
Block E	First floor	Biodegradable and non-biodegradable	Small	2
Block E	Toilets	Sanitary and hazardous	Small	1
Block F	Ground floor	Biodegradable and non-biodegradable	Small	2
Block F	Toilets	Disposables	Small	1
Block F	First floor	Biodegradable and non-biodegradable	Small	2
Block F	Toilets	Disposables	Small	1
Block G	Campus	Biodegradable and non-biodegradable	Trolley bins	2
Block G	Canteen	Biodegradable and non-biodegradable	Trolley bins	2
Block G	Library	Non-biodegradable	Small	1
Block G	Xerox shop	Dry waste	Small	1

1. **Material Recovery Facility:** The college can set up a material recovery facility (MRF) behind the men's hostel. The MRF could be a single unit with compartments or multiple receptacles to store plastics, paper, glass, metal and textiles (Image 8). The college can engage a waste picker or local scrap shop dealer to collect the items periodically.

Image 4: Material Recovery Facility

2. **Horticultural waste** can be collected and composted in simple pits made from bamboo or concrete rings or compartments (Image 5).

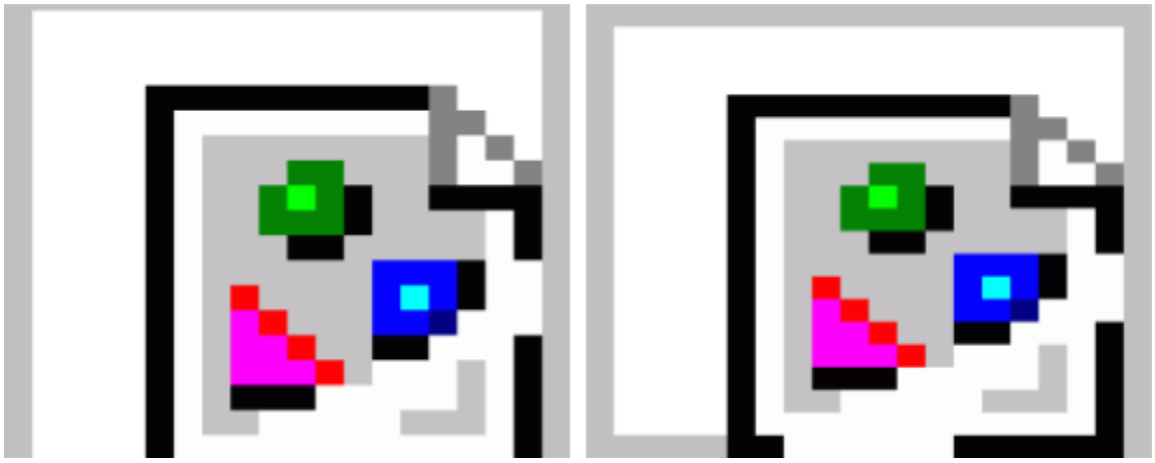

Image 5: Concrete and bamboo pit options for composting horticulture waste

3. **Ban single use plastic:** The college must ensure that single-use plastic forks, spoons, juice cups, and straws are not sold on campus. It can ensure that the mess and canteen provide reusable foodware and there are water dispensers across the campus. It should also mandate students and staff to carry a reusable utensil pack consisting of a coffee/tea mug with lid, spoon and fork, and straw.

4. **Core committee**: The college can create a committee comprising students, teaching staff and housekeeping staff with the mandate of making the campus zero waste. This committee can oversee the activities of the solid waste management at the college and explore activities that students can undertake inside and outside the campus. The committee can also include a member student from the Student Development Council.

5. **Inform and educate**: Public education and institutional changes are key components to revamp the existing waste management system in the city. Faculty can incorporate aspects of this in their engagement with students and also encourage them to take up meaningful projects with civil society organisations. Students can develop alternate media forms to disseminate information, such as street plays, mimes and puppet shows. Implementation of regular campus-wide education and outreach efforts through newsletters, social media, zero waste events, and DIY (do it yourself), repair and reuse workshops.