

# Recording Solid Waste and Management Practices in Manasagangotri Campus, Mysore, India

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**Abstract:** Systematic field investigation was made to record the solid waste and its management practices followed at Manasagangotri campus of University of Mysore, Mysore during January to March, 2020 by following standard methods. Altogether 101 different types of solid wastes were recorded. Commonly occurring solid wastes included 14 type plastic products, 13 cellulose containing paper items, 23 types of e-wastes, 18 types of metal items, 14 type of food items and 12 different fruits wastes and their percent occurrence varied considerably. However, other waste viz., dry leaves, broken buckets, wooden chairs, glass wares, table clothes and porcelain wares constituted 15.6% at different Post-Graduate Departments (PGDs) in Manasagangotri campus. The cleaning, storing and disposal of accumulated solid waste was made regularly. The Mop and Broomsticks were used 40.8% each; dust remover and vacuum cleaners were used respectively 14.3 and 4.1% during time of need for cleaning. Dustbins (76%) and plastic bags (4%) were commonly used to store solid waste. Moreover, majority (60%) of PGDs dispose the collected solid waste every day. Further, accumulated waste was classified into biodegradable (e.g. paper, food and fruit wastes) and non-biodegradable (e.g. plastic, metal and e-waste) waste and their percent occurrence was 39 and 45.4 respectively. Available all these solid wastes are periodically disposed through proper channels after obtaining administrative sanctions by the University authorities. Besides, the dry leaves and other cellulose containing materials are recycled properly to produce organic manure amidst Manasagangotri campus. All these activities help achieve cleanliness, hygienic conditions along with greenery in and around PGDs and made the Manasagangotri campus as one of the best campuses in India in general and south India in particular. University is an apex body in the education system, to achieve quality education, clean and hygienic environment is must. In this regard, University of Mysore became model to other educational institutes in this part of the country.

**Keywords:** Solid waste, Management, Manasagangotri, Mysore, India.

## I. INTRODUCTION

Solid waste is an unwanted and unusable material, discarded after its primary use during various academic activities amidst educational institutes. Produced solid waste becomes a 'resource' for the synthesis of several usable by-products with or without economic value. If waste is not properly managed, it may cause harm to local ecosystem. In recent years, managing waste free ecosystem is on the rise at educational institutes (Nandini and Basavarajappa, 2018), where pupil from different parts of the world are pursuing higher education. In India, many educational institutes are facing solid waste problems due to various academic reasons. If proper action is not taken in/on solid waste both garbage and sewage accumulate voluminously and develop pressure on local administration. Piled up solid waste may threaten students health, environment and well being of the educational institutes also (Mazumdar, 1994; Siddiqui *et al.* (2013).

Several authors have conducted field survey on solid waste collection and management at different cities in India and other parts of the world. Published reports suggested that many educational institutes are doing well while managing the solid waste. Surprisingly, many educational institutes are in an infant stage at different parts of the world. The paper, plastic, metal and e-wastes are produced in huge quantity during various academic activities. The generated waste may be or may not be potentially hazardous, however it requires proper disposal to assure clean and hygienic conditions amidst educational institutes. Otherwise, it becomes hazardous, create environmental problem and becomes nausea to student community (Mishra and Pandey, 2005).

At this juncture, Government of India has insisted through University Grants Commission (UGC), New Delhi that campuses of educational institutes should be clean, hygienic and free from any solid waste (Anonymous, 2018). However, saying is easy but, managing the solid waste is a challenging task in many educational institutes and becomes a major

burning issue in recent years (Nandini and Basavarajappa, 2018). Therefore, periodic updating of solid waste management practices followed at educational institutes is necessitated.

In Karnataka, the solid waste and its management practices followed in Mysore was reported by Chandra and Devi (2009), Siddiqui *et al.* (2013), Chavan and Patil (2017). Further, reports are available on solid waste management practices at health care centers (Sashikala, 2018; Sashikala and Basavarajappa, 2018), food supplying centers (Megha, 2018; Megha and Basavarajappa, 2018), commercial areas and public places (Mamatha, 2018; Mamatha and Basavarajappa, 2019), educational institutes (Nandini, 2018; Nandini and Basavarajappa, 2018), residential areas (Kshema, 2018; Kshema and Basavarajappa, 2018) in Mysore city.

Although, these researchers have provided useful information on solid waste and its management in Mysore city, published reports at higher education institutes is wanting. In this regard, present study was undertaken to collect scientific information on source of solid waste and its disposal practices employed by different PGDs amidst Manasagangotri campus, Mysore. Since, 'Manasagangotri' is the main campus of University of Mysore, published reports on waste separation, disposal, storage devices used here are scanty. Therefore, attempts were made with an intention to help fill the gaps in the present knowledge on solid waste management practices followed in Manasagangotri of University of Mysore, as it is one of the apexes of higher education.

## II. MATERIAL AND METHODS

**Study area:** Mysore is the cultural capital of Karnataka State, commonly called 'City of Palaces' (Anonymous, 2008) and located at the vicinity of Chamundi Reserve Forest Hills (Kamath, 2001). The Mysore is called one of the 'educational hubs' in India, where 100 years old prominent 'University of Mysore' was established in 1916. It is the sixth oldest in India and the first in the State of Karnataka. There are about 1.11 Lakh students are pursuing their Under-Graduate and Post-Graduate courses at 226 affiliated Colleges, 66 recognized Research Centers, 157 Outreach Research Centers, eight Training Centers, 47 specialized programs, 38 Foreign and 27 National collaborations. Enrollment of a large number of overseas students from 63 countries reflects the international reputation of the University. It was the first university to be accredited by NAAC in 2000 with five star statuses. Presently, the University is re-accredited by NAAC with 3.47 CGPA of 4.0 Scale and NIRF-2020 ranked 27 in University Category & 47 in Overall Category in India. To conduct the present investigation, Manasagangotri campus is selected. Manasagangotri is the main campus of University of Mysore, lies 12°18'28.33"N and 76°38'21.75" E at an elevation 2,479.4 ft above msl. It is spread with >800 acres of geographical area amidst Mysore city. The campus has well grown avenue trees, neatly maintained lawns, ground vegetation with CCTV surveillance (Anonymous, 2020; Nagaraj, 2020). The 'Manasagangotri' is housed with >63 PGDs, which have offered >78 Post-Graduate programs for 12000 students. Further, there are 14 Chairs and 13 DST-FIST, UGC-SAP funded Departments along with 13 supporting units are functioning to give quality education to the youths. Besides, there are Administrative Buildings, University Quarters, Guest Houses, Men and Women Hostels, Catering Centers are established with good ambience amidst Manasagangotri campus. Around 7,000 students are pursuing their higher education at PGDs and Research Centers around the year (Anonymous, 2020). To provide high quality education to students, maintenance of hygienic conditions, waste free environment at the premises of various PGDs, Research Centers and Administrative Buildings, Men and Women Hostels and Catering Centers, good solid waste disposal practices are necessitated.

**Methodology:** Present study was conducted for a period of three months i.e., from January to March, 2020 to record commonly occurring solid wastes at PGDs, Research Centres, Administrative Buildings, Guest Houses, Men and Women Hostels and Catering Centers (Table I). Persons who were in-charge at selected Departments/Offices/Hostels/Guest Houses were met personally two times in a week. To record the solid waste, pre-tested questionnaire was prepared as per Nandini and Basavarajappa (2018). The origin, source, production, collection, storage, isolation, transportation and disposal of solid waste were taken maximum care while collecting the data during the field study. Total 52 PGDs/Offices were randomly selected and visited personally to collect the scientific information on solid waste management. Pre-tested questionnaire was distributed to all the PGDs and collected duly filled questionnaires after interacting with the head of the institution. However, due to the pandemic COVID-19, all the Departments were declared holiday on 23<sup>rd</sup> March, 2020. Ultimately, we could able to collect only 40 duly filled questionnaires. The collected information on sources of solid waste, waste storage, collection, transportation, disposal methods and solid waste management practices were collected by following standard methods. Information on waste segregation and disposal was made as per Harish (2012). Collected data was compiled systematically and analyzed as per Megha and Basavarajappa (2018), Kshema and Basavarajappa (2018), Shashikala and Basavarajappa (2018), Mamatha and Basavarajappa (2018), Nandini and Basavarajappa (2019). Per cent occurrence of different solid wastes was calculated by using statistical analysis as per Saha (2009).

### III. RESULTS

**Types of wastes:** Altogether 101 different types of solid wastes were produced during various academic activities at different institutes in Manasagangotri campus (Table II). Percent occurrence of paper, plastic metal, food, fruits and e-wastes in Manasagangotri campus is depicted in Table II.

**Plastic waste:** Altogether, 14 types of plastic wastes were commonly found amidst Manasagangotri campus, Mysore (Table III). Amongst them, used plastic pens, refills, ink plastic vials were found more (12.5%) and it was followed by chocolate covers (11.6%), water/juice plastic cups and bottles (10.7% each). Moreover, plastic coated soap/ detergent covers (9.8%), snacks covers, ice cream cups (8%) and plastic sachets/wrappers, plastic cups and plates (7.1% each) were found commonly in the premises of Manasagangotri campus (Table III). Further, the plastic coated empty sweet box covers and old polythene covers (6.3% each) and butter milk sachets (5.4%) were also found at few PGDs premises. However, oil plastic bottles/sachets, plastic hand gloves, syringes and their wrappers, medicine wrappers, tablet covers and tonic bottles were found less than 5% (Table III).

**Paper waste:** Total 13 types of cellulose containing waste constituted the paper waste in Manasagangotri campus (Table III). Percent occurrence of various paper wastes in Manasagangotri campus is depicted in Table III. The Tea/coffee paper cups and tissue paper waste was found more (12% each) and it was followed by incompletely used papers, old calendars and magazines (11.1% each). The paper plates and cups percent occurrence was 10.3. The sanitary pads (8.5%), used news papers (7.7%), old note book sheets and journals (6.8%), challans and old office files and letters (6.1%) were also found >5%. However, cardboard sheets, match boxes, medicine slips and food packing covers were found <5% (Table III).

**E-waste:** Total 23 e-wastes were commonly found during the present study in Manasagangotri campus. Percent occurrence of e-waste found at various PGDs premises in Manasagangotri campus is depicted in Table IV. The electric devices such as mouse, pen drives, CD's, floppies, computer monitor, keyboard, hard disc, smart phone, ear phone, camera and its accessories, mobile charger, CPU, scanner, screen guard, pointer, calculator, remote controller along with batteries and UPS were commonly found as e-waste during the present study amidst Manasagangotri campus (Table IV). Of all, used or unused CD's were more (9.4%) commonly found and it was followed by old mouse, keyboard, hard disc, batteries and printers were found 8.3% each. Moreover, the computer monitor and calculator were found 7.3% each. The used and unused pen drives (6.2%) computer CPU, scanner and UPS were found 5.2% each as e-waste. Further, the percent occurrence of floppies, remote controller, screen guard and other items were found <4 (Table IV).

**Metal waste:** Total 18 wastes made of different metal were found as waste at Manasagangotri campus (Table IV). Percent occurrence of different metal waste is shown in Table IV. Old used bulbs found highest (23.4%) and it was followed by used cable wire (15.6%) and old knives (9.3%). The needles, metal nails and rusted unused other metal items found 7.8%. Moreover, the broken metal utensils (6.3%), spatula (4.7%), table lamps (3.7%) were commonly found as waste in Manasagangotri campus. Further, the induction stove, broken forceps, surgical instruments and other metal instruments percent occurrence was only 3.1 (Table IV). The timing chain, microscopes, stereozoom microscopes, laboratory instruments, incubators, ovens and refrigerators were found <2% (Table IV).

**Food waste:** Altogether, 14 different food items were found as waste in Manasagangotri campus. Percent occurrence of food waste is depicted in Table V. Highest food waste was coffee and tea extract (11.8%) and it was followed by idly and chatni, rice and sambar, chapatti and roti were found 10.3% each. The dose, vada, sweet items were found 8.8% each. The poori and curry, pieces of chips and milk products were found 7.4% each. The bakery items were 5.9% followed by other food items. However, non-vegetarian items such as eggs, egg shells, boiled egg pieces and bone pieces were found 2.9% each (Table V).

**Fruit waste:** Total 12 different fruits peelings were found as waste in Manasagangotri campus. Percent occurrence of various fruit wastes is shown in Table V. Banana and its peelings were found more (16.7%), followed by apple and orange peelings (10.4% each). Moreover, pomegranate, grape, sweet lemon and jack fruits waste was occurred 8.3% each. The water melon peelings, chikku fruit waste was found 6.3% each. The butter fruit and musk melon waste was 4.2% each found in Manasagangotri campus (Table V).

**Other wastes:** Eight solid wastes were included under other waste category. Percent occurrence of other wastes recorded during the present study is depicted in Table 6. Dry leaves found more (18.3%), followed by broken buckets and chairs (17.2% each), wooden materials (16.1%), broken glass wares (14%) and table covers (11.8%) found at different PGDs in Manasagangotri campus in Mysore (Table VI). Further, porcelain wears was also found 5.4% as waste.

**Clean, store and disposal of solid waste:** Two devices were commonly used for waste cleaning in Manasagangotri Campus, Mysore. The mop and broomsticks were used 40.8% each at most of the PGDs. Moreover, dust remover and vacuum cleaners were also used some times and their percent use was respectively 14.3 and 4.1 (Table VII). The dustbins and plastic bags were commonly used to store solid waste. The dustbins were used more (76%) and the plastic bags were used only 4% during solid waste storage. However, 20% of PGDs were used both dustbins and plastic bags for solid waste collection and storage (Table VII). Majority (60%) of PGDs have disposed the collected solid waste every day. It was followed 30% PGDs, which have adopted solid waste disposal twice in a week. Around 10% of PGDs have disposed their collected solid waste once in a week in Manasagangotri Campus, Mysore (Table VII).

**Biodegradable and non-biodegradable waste:** The biodegradable waste includes paper, food and fruit wastes found respectively 19.6, 11.4 and 8% in Manasagangotri campus (Table VIII). The non-biodegradable waste includes plastic, metal and e-waste found respectively 18.7, 16 and 10.7% in Manasagangotri campus (Table VIII).

**Other waste:** Other wastes viz., dry leaves, broken buckets, chairs, glass wares, wooden materials and table covers constituted 15.6% in Manasagangotri campus.

## VI. DISCUSSION

Solid waste appears regularly at educational institutes due to various academic activities. It is a continuous process and everyday good amount of waste is accumulated Macwan *et al.* (2003) that demands regular disposal (Huang *et al.*, 2006; Sharholiyet *al.*, 2008). Total 101 different types of solid wastes were produced during various academic activities at Manasagangotri campus of University of Mysore. The major solid waste found during present study were plastic products (14 types), cellulose containing paper items (13 types), e-wastes (23 types), metal items (18 types), unused food items (14 types), fruits wastes (12 types) along with dry leaves, broken buckets, wooden chairs, glass wares, table clothes and porcelain wares at different PGDs. Similar types of solid wastes were reported from schools and colleges in Mysore city by Nandini and Basavarajappa (2018).

All the PGDs are following good practices to clean institute/centers premises by using mop, broomsticks, dust remover and vacuum cleaners. Further, collected waste was stored in dustbins (76%) and plastic bags (4%). Around 60% of PGDs have disposed the collected solid waste every day. However, 40% of PGDs didn't dispose solid waste regularly and demands attention for regular disposal of solid waste. It is a common problem in many educational institutions due to various reasons (Nandini and Basavarajappa, 2018). Further, most of the PGDs have taken care to segregate the produced solid waste into biodegradable (e.g. paper, food and fruit wastes) and non-biodegradable (e.g. plastic, metal and e-waste) waste during their disposal. As the percent occurrence of biodegradable and non-biodegradable waste was respectively 39 and 45.4 in Manasagangotri campus, created scope for recycling. Since, Mysore is one of the smart cities in India, obtain >3 times 'clean city status' from Government of India, New Delhi (Anonymous, 2020), the educational institutes contribution mustn't be ignored in this regard. Similar type of observations were made by Malvia *et al.* (2002), Pappuet *al.* (2007), Sharholiyet *al.* (2008), Agarwal *et al.* (2016) Das (2016), Gupta and Arora (2016) have reviewed the solid waste management for smart cities in India.

Besides, the dry leaves, and cellulose containing materials are recycled properly to produce organic manure in the premises of the DOS in Sericulture Biotechnology, Manasagangotri campus. Moreover, produced non-biodegradable solid waste (e.g. metal items) is periodically disposed by the PGDs through proper channels after obtaining the administrative sanctions by the University authorities. All these activities help achieve cleanliness, hygienic conditions along with greenery in and around PGDs and made the Manasagangotri campus as one of the best campuses in India in general and south India in particular. University is an apex body in the education system, to achieve quality education, clean and hygienic environment is must. In this regard, University of Mysore became model to other educational institutes in this part of the country.

Further, there is a lot of scope prevailed for recycling the available solid waste in Manasagangotri campus. Metal waste can be used to produce recycled metal items for various uses. Electronic items are made with different types of plastic with various categories, which can be recycled to produce recyclable plastic items viz., utensils, pots, trays, covers, carry bags etc. Further, by selling solid waste, considerable amount of revenue can be generated. The ban of plastic waste is already initiated in many educational institutes in India (Anonymous, 2018). Non-biodegradable wastes such as metal, rubber, glass, plastic and electronic items offer more scope for recycling (Brigden *et al.*, 2008; Sivaramanan, 2013). Many foreign courtiers are recycling the non-biodegradable wastes (Dijkgraaf and Gradus, 2004; Ferrara and Missios, 2005; Wilfred and Moindi, 2008) and produce several by-products. Similar type of action is required to make Manasagangotri campus as plastic free campus. On this line, investigations are necessitated to make use the available solid waste efficiently and make the campus greener around the year and make zero solid waste campus in the years to come.



Furthermore, during the contemporary times, nothing is going as waste! Waste is a 'resource' and raw material for the production of innumerable by-products. It is right time to strengthen the existing solid waste management practices. The concerned authorities in academic educational institutes should think, plan and act in this direction to realize the potential implications of waste resource for human benefits. In this regard, Yadav and Devi (2009) have contributed much and Javeriya *et al.* (2013) have suggested taking proper action to manage the solid waste. Nandini and Basavarajappa (2018) have suggested the use of available solid waste as resource for the synthesis of usable by-products. The impact of solid waste at human-inhabited places was rightly reported by Megha and Basavarajappa (2018), Shashkala and Basavarajappa (2018), Kshema and Basavarajappa (2018), Mamatha and Basavarajappa (2018) in Mysore city. Therefore, sound management practices are need of the day as was suggested by Siddqui *et al.* (2013), Chandrashekar and Sequeria (2015), Chavan and Patil (2017). Our observations are on par with the observations of above-mentioned authors.

University is a 'temple of learning', where pristine pure clean environment is necessitated to achieve set goals during higher education by the post-graduate youth. It is the apex body of education system in India and the seat for the development of new innovations, plans, strategies, protocols and methods, which could be used as model to educational institutes like under-graduate, collegiate, high school, primary schools and other commercial and business offices. In the current situation, university role is pivotal to convey innovative methods to combat and control the burning issues of solid waste. Further, emphasis should be given to educate and train the post-graduate students at least one or two hours in a week on waste management. For that there must be one- or two-hour's time to be allocated in the time-table every week. In consultation with researchers from environmental science, botany, microbiology, biotechnology, chemistry, physics, zoology and social science disciplines, educative lectures and interactions should be conveyed to address the burning issues of solid waste management.

Further, invited lectures must be arranged from environmentalists, biologists, chemists, waste analysts, policy makers and environmental engineers to have an insight on prospects and retrospect's of waste to post-graduate students. Skilled man power is the future need of developing India; interested post-graduate youths can be made aware about these activities. Further, more scope is prevailed to learn about the organisms such as termites, earthworms, bacteria which feed on cellulose containing material. If biology of these organisms is known, it would help assist in vermiculture and organic manure production activities. This type of activities is need of the day, which could help create better understanding the role of youth after higher education. Similar type of approaches was reported by Megha and Basavarajappa (2018), Shashkala and Basavarajappa (2018), Kshema and Basavarajappa (2018), Nandini and Basavarajappa (2018), Mamatha and Basavarajappa (2019). Our observations are on par with the published reports of Malvia *et al.* (2002), (Kansal, 2002), Rathi (2006), Pappu *et al.* (2007), (Sharholly *et al.*, 2007 and 2008), (Singh *et al.* 2014), Agarwal *et al.* (2016) Das (2016), Gupta and Arora (2016), Sonia (2018).

## **VI. CONCLUSION**

Any waste arises due to various man-made activities require disposal. Before disposal, waste must be isolated into biodegradable, non-biodegradable, edible, non-edible, dry and wet waste. Emphasis should be given to consider such waste as resource to produce by-products after recycle. At this juncture, at university level, more plans, innovations and strategies are required to make use waste as resource for the synthesis by-products. As universities are apex bodies of higher education, many researchers are working at different disciplines (e.g. Environmental Science, Geology, Zoology, Botany, Microbiology, Chemistry, Physics, Biotechnology, Social Sciences, Business Management, Commerce and Administration etc.), their experience and expertise could be utilized to solve burning issues of solid waste management amidst urban centers. This type of approaches could help bring down the solid waste problem and solve by throwing light on new avenues of composting, organic farming, recycling and converting waste into resources for the synthesis of useable by-products which is need of the day. From this, it is possible to achieve zero pollution, generate little revenue, keep away the diseases and maintain clean and hygienic environment.

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Table I: Institutions selected for sampling in Manasagangotri campus, Mysore (N=20)

Sl.No.	Institution		%Cover
1.	Anthropology	Post-Graduate Department	70.0
2.	Botany		
3.	Chemistry		
4.	Fine and Arts Collage		
5.	Food Science and Nutrition		
6.	Gandhian Studies		
7.	Genetics and Genomics		
8.	History		
9.	Jainology		
10.	M.Com		
11.	Philosophy		
12.	Sanskrit		
13.	Sericulture		
14.	Statistics		
15.	Danida Guest House	Guest House	10.0
16.	Manasa Guest House	Office	10.0
17.	Post Office		
18.	K-SET Office	Hostel	5.0
19.	Boys Hostel		
20.	University Canteen	Canteen	5.0
Total			100.0

Table II: Name and types of solid wastes recorded inManasagangotri campus, Mysore (N=40)

Sl.No.	Name of Waste	No. of TypesRecorded	% Occurrence
1.	E-Waste	23	22.8
2.	Food waste	14	13.9
3.	Fruits waste	12	11.8
4.	Paper waste	13	12.9
5.	Plastic waste	14	13.9
6.	Other waste	7	6.9
Total		101	100.0

Table III: Paper and plastic wastes recorded in Manasagangotri campus, Mysore (N=40)

Sl.no	Name of Plastic waste	%Occurrence	Sl.No.	Name of Paper waste	%Occurrence
1.	Butter Milk Sachet	5.4	1.	Card Board Sheets	3.4
2.	Empty Sweet Box Cover	6.3	2.	Challans &Waste Office Letters	6.0
3.	Chocolate Covers	11.6	3.	Incompletely Used Papers	11.1
4.	Oil Plastic Bottles \ Sachets	4.5	4.	Used News Papers	7.7
5.	Plastic Sachets \Wrappers	7.1	5.	Tea/ Coffee Paper Cups	12.0
6.	Snacks Covers & Ice Cream Cups	8.0	6.	Paper Plates and Cups	10.3
7.	Water & Juice Plastic Bottles	10.7	7.	Food Packing Covers	3.4
8.	Plastic Cups & Plates	7.1	8.	Sanitary Pads	8.5
9.	Medicine Wrappers & Tablet Covers/ Tonic Bottles	2.6	9.	Old Calendars and Magazines	11.1
10.	Syringes & Wrappers	3.6	10.	Old Note Book Sheets and Journals	6.8
11.	Hand Gloves	4.5	11.	Match Boxes	3.4
12.	Used Soap/Detergent Covers	9.8	12.	Medicine Slips	4.3
13.	Used Pens, Ink Bottles & Refills	12.5	13.	Tissue Paper Waste	12.0
14.	Old Polythene Covers	6.3			
Total		100.0	Total		100.0

Table IV: E-waste and metal waste recorded in Manasagangotri campus, Mysore (N=40)

Sl.No.	Name of e-waste	% Occurrence	Sl.No.	Name of Metal waste	% Occurrence
1.	Old mouse	8.3	1.	Induction Stove	3.1
2.	Used/Unused pen drives	6.2	2.	Needles & Metal Nails	7.8
3.	Used/Unused CD's	9.4	3.	Broken Forceps or Surgical Instruments	3.1
4.	Used/Unused floppies	3.1	4.	Unused metal Instruments	3.1
5.	Computer Monitor	7.3	5.,	Spatula	4.7
6.	Computer Key board	8.3	6.	Broken Utensils	6.2
7.	Computer Hard disc	8.3	7.	Old Bulbs	23.4
8.	Smart phone	1.1	8.	Old Knifes	9.3
9.	Ear-phone	1.1	9.	Timing Chain	1.6
10.	Batteries	8.3	10.	Unused\rusted Metal Items	7.8
11.	Camera & its accessories	2.1	11.	Microscopes	1.6
12.	Mobile charger	1.1	12.	Sterozoom microscopes	1.6
13.	Printer	8.3	13.	Table Lamps	3.7
14.	Computer CPU	5.2	14.	Un used Cable Wire	15.6
15.	Scanner	5.2	15.	Laboratory instruments	1.6
17.	Screen Guard	1.1	16.	Incubator	1.6
18.	Pointer	1.0	17.	Hot Air Ovens	1.6
19.	UPS	5.2	18.	Refrigerators	1.6
22.	Calculator	7.3			
23.	Remote controller	2.1			
Total		100.0	Total		100.0

Table V. Food and fruits waste recorded in Manasagangotri campus, Mysore (N=40)

Sl.No.	Name of thewaste	% Occurrence	Sl.No.	Name of the waste	% Occurrence
1.	Idli&Chatni	10.3	1.	Water melon & its peelings	6.3
2.	Dosa& Vada	8.8	2.	Chikku& its peelings	6.3
3.	Rice & Sambar	10.3	3.	Orange & its peelings	10.4
4.	Poori& Curry	7.4	4.	Papaya & its peelings	8.3
5.	Sweet items	8.8	5.	Banana & its peelings	16.7
6.	Milk products	7.4	6.	Pomegranate & its peelings	8.3
7.	Coffee\Tea extract	11.8	7.	Grape & its wastes	8.3
8.	Bones pieces	2.9	8.	Sweet lemon & its peelings	8.3
9.	Boiled eggs and their shells	2.9	9.	Butter fruit & its waste	4.2
10.	Bakery items	5.9	10.	Jack fruit & its waste	8.3
11.	Pieces of chips	7.4	11.	Musk melon & its waste	4.2
12.	Chapatti &Rooti	10.3	12.	Apple waste	10.4
13.	Raw vegetables	1.4			
14.	Other Food items	4.4			
Total		100.0	Total		100.0

Table VI: Other waste recorded in Manasagangotri campus, Mysore (N=40)

Sl.No.	Name of the waste	No. of Dept. said Yes	% Occurrence
1.	Broken buckets	16	17.2
2.	Broken chairs	16	17.2
3.	Broken glass wares	13	14.0
4.	Wooden materials	15	16.1
5.	Dry leaves	17	18.3
6.	Table covers	11	11.8
7.	Porcelain wears	5	5.4
Total		93	100.0



Table VII: Devices used to clean, store and dispose solid wastes in Manasagangotri campus, Mysore (N=40)

Sl.No	Name of the Device	% Use	Name of Devices	% Use	How often waste disposed	% Use
1.	Mop	40.8	Dustbins	76.0	Once in a week	10.0
2.	Broomstick	40.8	Plastic bags	4.0	Twice in a week	30.0
3.	Dust Remover	14.3	Both	20.0	Everyday	60.0
4.	Vacuum Cleaner	4.1	-	-	-	-
Total		100.0	-	100.0	-	100.0

Table VIII: Bio-degradable and non-biodegradable solid wastes recorded in Manasagangotri campus, Mysore (N=40)

Sl.No	Type of Waste	% Occurrence
1.	Bio-degradable	39.0
2.	Non-biodegradable	45.4
3.	Other	15.6
Total		100.0