Audit Report

Solid Waste and E-Waste

Khudiram Bose Central College

2022-23

2023-24

Conducted by

Society for Direct Initiative for Social and Health Action

(DISHA)

Acknowledgement

We thank the authorities of the Khudiram Bose Central College for providing us opportunity to conduct audit of solid waste and E-waste generated in the institution in the year of 2022-23 and 2023-24. We especially thank the Principal Dr. Md. Afsar Ali and Mr. Debasis Mallick, President of the Governing Body and all other members of Governing Body for their understanding the need of conducting an audit and encouraging the team. We are grateful to Prof. Sriparna Dutta, IQAC Coordinator and Dr. Shilpa Nandy and Prof. Tapasi Ghosh, Joint NAAC Coordinators for their persistent initiative and relentless support, without which the assessment would not have been completed, nor the report prepared. We also thank the teaching and non-teaching staff and the students of the college for extending their whole-hearted support to the audit.

About us

The Society for Direct Initiative for Social and Health Action (DISHA) is a non-profit organization—working since 1995 to protect the environment and the rights of the communities directly dependent on natural resources. DISHA has been associated with a number of municipalities and government departments—especially the health department, pollution control board, and other public and private institutions. DISHA's activities include strategy-making, awareness generation, and on ground implementation on management of various categories of waste (MSW, health care waste, and E-waste), toxic issues, nature-oriented farming, coastal environment, conservation of wetlands and water bodies, and the protection and empowerment of children.

Sasanka Sekhar Dev
Secretary
Society for Direct Initiative for Social and Health Action (DISHA)

Society for Direct Initiative for
Social and Health Action

Preamble

Waste is wealth. Unfortunately, our lifestyle does not accept it. We often produce waste and discard those without thinking where it will finally arrive. Generally, waste is dirty, stinking and aesthetically unacceptable. Nobody likes to see scattered waste in the houses, institutions, localities and towns. Hence, efforts are made to remove the waste to clean our surroundings. The problem is worse in urban agglomerations, where, due to population density, waste is produced in huge quantities. Usually the citizens depend on municipal service to take them away. In most cases, those wastes are dumped at the outskirts of towns and cities. These dumps develop into hillocks, stink, pollute surroundings, and contaminate water bodies and ground water. Large amount of methane is produced due to rotting of biodegradable waste. Methane is a greenhouse gas, with climatic effects as high as 21 times that of carbon dioxide. Non-biodegradable recyclable wastes lose their value in non-sorted dumps and end up polluting soil, surface, and groundwater. Scavenging birds and animals having access to such dumps spread infection. Gradually land spaces become increasingly unavailable. Waste directly goes into the water bodies, wetlands, rivers, and seas – seriously damaging the environment. We often forget that a good number of people, called waste pickers, earn their bread by collecting soiled dry materials from the discarded waste from street sides and dump sites in an unhygienic manner. We also forget that a portion of wet waste, which is biodegradable, if processed, can increase fertility of land.

Apart from the general waste that we produce everywhere and every day, some other categories of wastes are generated. Electronic and electrical waste (popularly known as E-waste) is one of such categories. For these types of waste, the problem is different. Most of these wastes are of some value and directly sold or disposed of in a manner so that they get recycled. Use of these electronic and electrical items, both consumable and IT related, are increasing rapidly in course of time. These are used in bulk in offices, institutions and commercial establishments. Accordingly, bulk of the E-waste is generated from these sources. It is apparently welcoming that these wastes are recycled. But the important issue is that these items contain certain hazardous materials, such as lead, cadmium, mercury, PVC, and plastic materials containing phthalate. There is no problem with these materials when in use. But, when they end up as waste and are moved into the recycling stream, the problems begin. The recyclers, who do not have the ability or resources to follow formal recycling procedures, cannot prevent release of such hazardous materials in the environment. That causes serious pollution. Human health is affected due to informal recycling of such waste.

Objective

The Khudiram Bose Central College situated in the heart of Central Kolkata at 71/2A, Bidhan Sarani, Kolkata 700006 is one of the oldest and reputed colleges in Kolkata. Established in 1894, the college offers various streams and is attended by more than 1,400 students. The total teaching staff is around 42 and non-teaching staff is around 16. As expected, college activities result in a considerable amount of waste generation. The area is under the municipal service of Kolkata Municipal Corporation. The Corporation collects waste on a daily basis. As usual, most of the municipal waste is disposed of through this service. The E-waste was not separately stored and recorded. Those, often mixed with other dry solid waste, were sold to the agents of the informal recyclers as and when those were accumulated. Any conscious effort of reducing and using the waste was not present prior to 2021-22.

During that period several training workshops on solid waste management were jointly organized by the KBC College and DISHA as part of the NCC programme. Gradually the effort was transformed into a consistent plan to prepare an inventory of the sources and quantities of both municipal waste and E-waste generated in the college. Moreover, assessment of waste disposal practices and making improvement were felt necessary. Thus, DISHA was approached by the KBC College authority to conduct an audit of municipal solid waste and E-waste of the college on a yearly basis.

DISHA team started conducting the assessment in 2022 – 23 and made several interactions with the authorities, teaching and non-teaching staff and the students to understand the existing practices, perception, available infrastructure and the possibilities. Following is a consolidated report of the audit of both municipal waste and E-waste of the KBC college for the years 2022-23 and 2023-24.

The specific purpose of the waste audit is to: (a) quantify the amount of waste produced in an average, (b) identify the types of waste entering the waste bins, (c) identify the effectiveness of current waste reduction efforts and (d) create a list of recommendations to improve waste reduction efforts in the college premises.

Santanu Chacraverti

Swapan Mallick

Niladri Sekhar Ghosh

Salim Mallick

Rohit Bazga

Sasanka Sekhar Dev

Managing Waste – principles and practices

The problem of waste can be minimized by following the well-known basic principle of 3 Rs – Reduce, Reuse and Recycle. Generally, as compared to inhabitants of the developed world, the citizens of underdeveloped and developing countries do not generate much waste. However, the proportion of disposable items is gradually increasing in our daily life. The use of items made of plastics is increasing day by day. If conscious effort is made to stop using or **reduce the use of** such items, the volume as well as the problem of waste is lessened to that extent. **The reuse** of some materials also helps us reduce generation of waste. Many times it is seen that what is considered as waste for someone is usable for others. The responsibility of the managers of waste is to ensure transfer of such materials from the first group to the second group instead of dumping.

In our given socio-economic system, even the best efforts to reduce and reuse would result in gargantuan amounts of waste being produced. Here, the key solution is recycling. Basically, the solid waste we produce in daily life can be divided into two categories—**wet** and **dry**. Most of the wet or biodegradable waste can be recycled to produce organic manure, or green energy through bio-methanation. However, the initiative needs to be taken to store and collect such wet waste separately so that those can be processed. This is true for dry items also. If they are kept separately, only then they can be recycled through processing. If we store dry and wet discarded items in a mixed condition, processing becomes impossible. It is said, "Salt and sugar are both remarkably useful; but, once mixed, becomes waste".

The Ministry of Environment, Forest and Climate Change notified a set of rules for proper management of solid waste which must begin at the source. The **Solid Waste Management Rules 2016** states that the generators of waste should "segregate and store the waste generated by them in three separate streams namely biodegradable, non-biodegradable and domestic hazardous wastes in suitable bins." Hazardous waste such as sanitary diapers, sanitary pads etc., should be wrapped in suitable packs. The institutions should "ensure segregation of waste at source by the generators as prescribed in these rules, facilitate collection of segregated waste in separate streams, handover recyclable material to either the authorized waste pickers or the authorized recyclers". The residual waste should be given to the waste collectors of the local body.

In case of management of E-waste, the basic principle is the same. These have to be stored separately and should not be mixed up with general or municipal solid waste. As stated earlier, these items contain hazardous materials which, if released in the environment, cause serious pollution. The Ministry of Environment, Forest and Climate Change notified rules from time to time since 2011. The latest notification is E-Waste (Management) Rules, 2022 defines any consumer using at least one thousand units of electrical and electronic equipment at any point of time in the particular Financial Year may be termed as "Bulk Consumer". As per Rule 8, responsibility of the bulk consumers is to "ensure that e-waste generated by them shall be handed over only to the registered producer, refurbisher or recycler".

Methodology

DISHA's experience in undertaking waste audits and implementing waste management in a number of municipalities and health care units has definitely helped us in conducting this exercise. However, conducting a waste audit for an educational institution presented some new features for understanding and inclusion in the process. The following methodology was followed –

1. Literature Survey on making an inventory of waste and efforts to manage waste in educational institutions.

2. Repeated visits to understand the existing practices of waste generation, collection and disposal. Class rooms, staff rooms, departments, store rooms, library, terraces and especially canteens were repeatedly visited.

3. Collection and collation of data and ideas of waste generated in the years - July 22 to June 23 and July 23 to June 24.

4. Placing bins and planning for organized collection of generation of waste on a daily basis.

5. Sample survey conducted on four consecutive days from 10 June to 13 June 2024 to assess the categories and quantities of waste generated.

6. Interviews were arranged with 17 students, 4 teachers and 7 non-teaching staff to assess the average perception on waste management in general and inside the college premises. Moreover, their suggestions were invited for improvement of the present waste management system in the college.

Literature Survey

Since 2000, after notification of the first waste management rules by the Central Government, waste management has been accepted as an important environmental issue by many institutions in the country. They have taken steps to quantify and reduce waste as an essential part of appropriate waste management. The number of efforts has multiplied after notification of the 2016 Rules. Particularly for the higher education centres, the NAAC (National Assessment and Accreditation Council) has made such audits an important criterion for gradation. Therefore, one may come across a good number of such exercises of waste audit and management.

One such report—Assessment of Solid Waste Generation and Management in Selected School Campuses in Puducherry Region—was conducted in 2018-19 by Rajamanikam Ramamoorthy, Gopalsamy Poyyamoli, and Sunil Kumar in Puducherry. Analysis of variance was performed to test whether there is any variation in the amount of waste generated among different level of schools, corresponding to student age groups. It was revealed that the mean per capita waste generation rate is significantly different across different major age groups (primary, middle, high and higher secondary). The mean per capita waste generation rate gradually increased from primary to higher secondary schools due to the factors associated with age of the students, academic activities, type of schools; teaching and study materials used in different classes.

Another study was conducted by the Centre for Environment and Education (CEE) in collaboration with CESC in 50 schools in Kolkata, Hooghly and South 24 Parganas. Of them 30 were government schools. The CEE study emphasized more on reduction and reuse in comparison to quantification of waste. The students were taught to conduct a waste audit, by which they would be aware of how much paper, plastic and food wastes are generated daily. They were taught to produce greetings cards from discarded papers, reuse plastic bottles for vertical gardens where they can produce herbs.

Survey and Sampling

The team visited various areas of the college premises to understand the nature of the existing waste scenario and record an overall impression, summarized in the following.

Table 1

Observation of Location wise Details

SL. No.	Location	Status		Availability of waste bin	If yes, No. of bin	Remarks
		Inside	Outside			
1	Staff room	Almost clean	Almost clean	Yes	1	Bin without liner
2	1 toilet in Principal's room and another common toilet in the staff room	Almost clean	Clean	Yes	1 + 1	Covered waste bin without liner
3	Opposite of Library	Clean	Clean	Yes	1	Bin without liner
4	Library	Clean	Clean	Yes	1	Bin without liner
5	Department of Hindi	Almost clean	Unclean	No	N/A	Different kinds of papers and plastic wastes were scattered at the corners of stairs
6	Class room No. A2-5 & A2-4	Almost clean	Almost clean	No	1	Bin opposite of classroom without liner
7	Department of Political science – main room	Almost clean	Unclean	Yes	1	Small bin inside the room

8	Department of Political science - side room	Unclean	Unclean	No	N/A	Waste heap was seen outside the room
9	Department of History and Education	Almost clean	Almost clean	Yes	1	Bin without liner outside the room
10	NCC	Almost clean	Almost clean	Yes	1	Bin without liner outside the room
11	Department of Geography	Almost clean	Unclean	Yes	1	• Bin without liner was there. • Waste heap was seen inside of room
12	Department of English	Unclean	Unclean	No	N/A	No bin Different kinds of waste, i.e. plastic bottle, paper waste, plastic pouch, non-functional chair etc. were found inside as well as outside the room.
13	Department of Journalism and Mass communication	Almost clean	Almost clean	Yes	1	• Have a bin with cover • Have a non-functional (broken) bench in front of the room
14	Auditorium	Unclean	Almost clean	No	N/A	Different kinds of waste i.e. plastic bottle, paper waste, plastic pouch, useless chair etc. were found inside the room.
15	Office	Unclean	Almost clean	Yes	2 (In different locations)	Different kinds of paper, paper box etc. were seen inside the room, but were not confirmed as waste.

16	Students' Common room	Unclean	Unclean	No	N/A	• Considerable paper waste were found inside the room, • Considerable amount of waste on the entrance way
17	Union Room not opened	Unclean	Seen from outside - Not clean	No	N/A	Totally packed with different kinds of paper waste
18	Storeroom	Unclean	Unclean	No	N/A	Assorted discarded items like paper, obsolete books, broken pieces of iron and wood, etc. that have not been declared as waste and rechecking by the authority was needed.
19	Opposite of entry gate	N/A	Unclean	No	N/A	Have different kinds of electrical items apparently obsolete
20	1 Common wash room in office room and 1 common wash room in canteen	Moderate	Moderate	Yes	1 + 1	Few scattered waste
21	Ladies wash rooms –1 at 1st floor, 1 at 2nd floor and 1 at 3rd floor	Almost clean	Moderate	Yes	3	Though anticipated, any sanitary waste was not found in any of the bins. Scrap papers were found.

22	*Gents' wash rooms –1 at 1st floor, 1 at 2nd floor and 1 at 3rd floor*	*Moderately clean*	*Unclean at 1st floor and moderately clean at first and second floor*	*Yes*	*3*	*Scrap papers and plastic wrappers found inside the bins*
23	*1 Common wash room in Annex Building*	*Unclean*	*Moderately clean*	*Yes*	*1*	*Filled with plastic packaging*
24	*Canteen*	*Clean*	*Clean*	*Yes*	*2 (Inside and Outside)*	*Packaging of food, used tea leaves etc.*

Quantification of Municipal Solid Waste

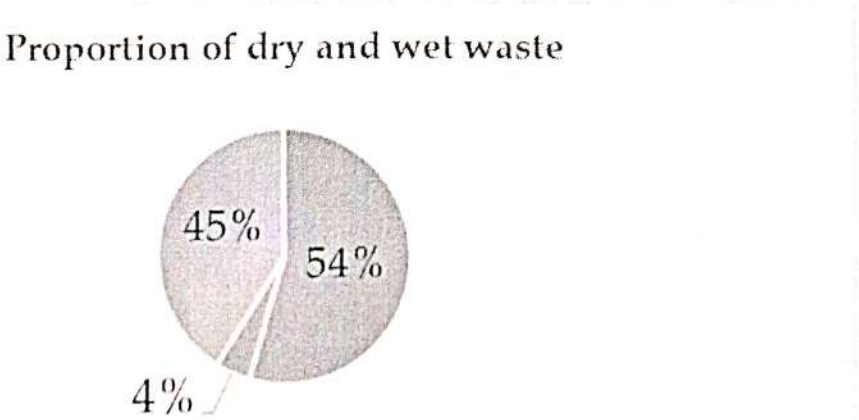
To quantify waste generated in 3 consecutive working days, 2 labelled bins – one for dry and one for wet – with appropriate liners were placed in each of these locations on 11 June. The teachers were requested to train all the students and non-teaching staff to dispose of their waste according to the labels of the bins. Next step was to weigh the source segregated wastes on 2 consecutive days. The data presented in the following table include the quantity of waste on 11 and 13 June 2024.

Table 2

Municipal Solid Waste Details					
Items		**Weight in Kg**			
I. Valuable Waste	**11.6.24**	**12.6.24**	**13.6.24**	**Total**	**Average per Day**
A. Scrap Paper	0.285	0.290	0.584	1.159	0.386
B. Paper box (sweet box etc.)	0.385	0.190	0.390	0.965	0.322
C. Ply board	0.000	0.030	0.000	0.030	0.010
D. Wood	0.015	0.000	0.000	0.015	0.005
E. Plastic bottle (PET bottle)	0.130	0.170	0.250	0.550	0.183
F. Plastic rope	0.050	0.000	0.025	0.075	0.025
G. Plastic Pouch	0.190	0.045	0.220	0.455	0.152
H. Used cup, glass, plate	0.550	1.160	1.220	2.930	0.977

I. Tetra pack	0.050	0.000	0.013	0.063	0.021
J. Glass bottle etc	0.000	0.000	0.000	0.000	0.000
K. Metal (Iron, aluminium, copper etc)	0.020	0.000	0.000	0.020	0.007
L. Carton	0.840	0.025	0.020	0.885	0.295
M. Card Board	0.250	0.421	0.170	0.841	0.280
N. Multi-layer polythene	0.175	0.150	0.080	0.405	0.135
O. Plastic Spoon	0.255	0.045	0.000	0.300	0.100
P. Foil paper	0.140	0.128	0.000	0.268	0.089
	3.335	**2.654**	**2.972**	**8.961**	**2.987**
II. Non-Valuable Waste					
A. Clay pots	0.000	0.000	0.000	0.000	0.000
B. Concrete, mud, sand and dust	0.280	0.090	0.125	0.495	0.165
C. Soiled plastic cups, glass etc.	0.080	0.075	0.085	0.240	0.080
	0.360	**0.165**	**0.210**	**0.735**	**0.245**
III. Wet Waste					
A. Food waste	2.640	2.580	1.230	6.450	2.150
B. Tissue paper	0.025	0.025	0.000	0.050	0.017
C. Vegetable peels, used tea bags, fruits	0.120	0.030	0.075	0.225	0.075
	2.785	**2.635**	**1.305**	**6.725**	**2.242**
IV. Household hazardous waste					
A. Sanitary napkin	0.000	0.000	0.000	0.000	0.000
Total	**6.480**	**5.454**	**4.487**	**16.421**	**5.474**

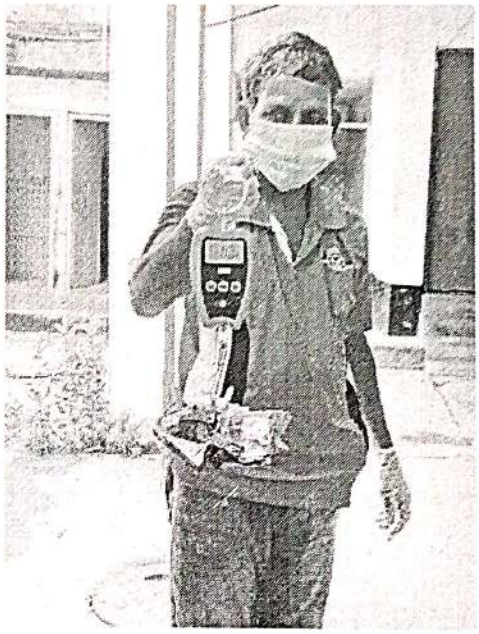
A comparison may be made to understand the proportion of valuable waste which may be sold, wet waste which may be processed and a very small portion which may go to sanitary landfill.



Average municipal solid waste generated daily in these three days is approximately 5.474 Kg of which wet waste is 2.242 Kg. But data of only 3 days cannot represent the average generation throughout the year. The attendances of the teachers and the students most often vary a lot. Seasonal variations, holidays, examinations are to be considered. Around 35 days are lean days.

Placing Bins

Sorting Waste



Weighing

It was ascertained from the authorities that due to semester examinations only 20% of the total students were present on these 3 days. In normal working days the amount of waste remains around 80% of the total students. Quantity of waste generated is around 4 times that of these lean days. Number of working days of the college in a year is 262 days. So the attendance on (262 – 35 = 227) days may be considered normal.

Hence quantity of total municipal solid waste generated in the year may be derived as –

$$(5.474 \times 35) + (5.474 \times 4 \times 227) \approx \mathbf{5161\ Kg}^{1}$$

During quantification of the waste, a responsible teacher, one office staff and the security guard were consulted regarding the pattern and volume of waste that could have been

[1] The approximation symbol allows for the rounding the decimals at various levels in the process of estimation.

generated in the last year. Students, who attended the training sessions on waste management in the NCC courses, were also consulted to get an idea of waste generation in the previous year. On this basis, we arrived at a conjectured estimation of the waste in that year.

This was important for projection of the quantity of generated in the previous year and for the next 3 years (assuming a 10% rate of increase).

Projected Quantity of Waste in Yr 22-23 and 24-25 to 26-27			
2022-23	2024-2025	2025-26	2026-27
4692.282	5677.661	6245.421	6869.961

The above figures do not include the large amount of scrap papers and materials in a store room adjacent to the roof. These are valuable waste but apparently lying unnoticed or ignored. The contents of such waste include the following -

a. Rope - 2 kg
b. Obsolete publications and magazine - 60 kg
c. Sliding window - 10 kg (5+5)
d. Iron rod - 50 kg
e. Construction equipment - 10 kg
f. Obsolete wooded items - 170 kg
g. Electrical items - 2.50 kg
h. Copybook - 600 kg
i. Uniforms and cloths - 5 kg

Value waste such as old newspapers and rejected copybooks etc. are not actually waste. However, they are discarded and then they are sold under the heading **"waste sales"**. But all the valuable wastes are not sold. Item **A to J in Table 2,** which are generated and discarded daily are not sold. But old newspapers and rejected copybooks etc. are stored and sold by the college periodically. Last such sale was conducted in March 2024. So it is obvious that the waste found in the room adjacent to the roof was not considered for sale. But such stores of waste, even if completely dry, give rise to unhygienic conditions and people tend to make such rooms dirtier. Examples of such bad practices were seen during our short visit.

A large amount of obsolete papers, mainly examination papers, were seen stored in the library and several departments. These deposits include internal examination papers,

semester examination papers, attendance books, tutorial examination papers, etc. Based on sampling of materials in shelves it was estimated that one almirah filled with such papers weigh around 90 to 100 Kg. It is ascertained that as per Rule the examination papers are to be kept for 6 years after their use. It may be assumed that every year, a certain proportion of these papers are sold for recycling. But no such record was found.

Perception on Municipal Waste

Few interviews, at random, were taken to get a sense of what students, teachers and the non-teaching staff thought about the needs, concerns, and procedures of waste management. A total of 17 students, 4 teachers and 7 non-teaching staff were interviewed. The salient points that emerged are as follows –

- Presently, is there any system of waste management in your college? - Out of 28 interviewees, 14 felt that there is some system of waste management and littering of waste is avoided, 8 consider there is no management and another 6 interviewees agree that partial efforts are taken to collect and dispose waste in a proper manner.

- Do you segregate waste at source before you discard those? - **None responded "Yes".**

- Where do you discard your waste? – 16 replied that they discarded waste in bins, 6 could not specify any practice and 6 of them informed that they took the waste out of the college and disposed it in street side bins.

- Do you make any effort to reduce waste generation? – 14 replied that they have stopped taking tea in paper cups, 6 among them stopped using plastic water bottles, 12 among them reported carrying metal or durable tiffin carriers, 4 replied that they have stopped using disposable pens, 4 reported that they have stopped using plastic carry bags for carrying exercise books and use reusable bags, 2 informed that they use laptops and notepads for writing to avoid generating paper waste.

Recommendations on Municipal Solid Waste

In view of the above, following recommendations appear to be in order to manage municipal solid waste in the college -

- Conducting several workshops to develop understanding among all concerned that waste is wealth and that its management is necessary for

improving the college environment. Display of IEC materials will help to raise awareness.

- Installing two covered bins with liners at every generation point. Two colour codes (Blue and Green) should be used to collect dry and wet waste separately. In ladies' toilets, special bins should be placed with liners for disposing sanitary napkins. Students should be made aware that any sanitary waste including sanitary napkin should be disposed of after properly wrapping it inside a packet with a red cross drawn on it.

- Collection of wet waste, which is 45% of total municipal waste, needs to be done every day so that the wet biodegradable waste does not start rotting. This wet waste needs to be placed in a composting drum to be kept at a corner of the roof. Every day, this wet waste is to be appropriately handled in order to process and transform it into drum compost. This compost may be used in the college garden.

- Guidelines should be issued to the individuals to dispose the sanitary napkins, diapers or any sanitary waste in a wrapper so that these may be sent to the municipal stream in wrapped condition with a sign of cross in red colour to indicate hazardous waste. Any waste generated due to the use of the first-aid box and any broken glass, needle and sharp items should be processed similarly.

- Efforts to be made to reduce waste as much as possible. Use of disposable plastic bags, cutlery, and water bottles may be restricted. Everyone should be encouraged to use cloth bags, metal or durable tiffin boxes and water bottles. Paper cups may be replaced by washable glass or cups.

- Dry waste which is 55% need not be collected frequently—as these do not rot or stink. But, after collection, these should be sorted into valuable (54%) and non-valuable (4%) recyclable items. The valuable items may be sold or handed over to the waste collectors / kabadiwalas. These should not go into the municipal waste streams.

- Only the non-valuable items (only 4%), which are non-recyclable, should be handed over to the municipal collector for disposal.

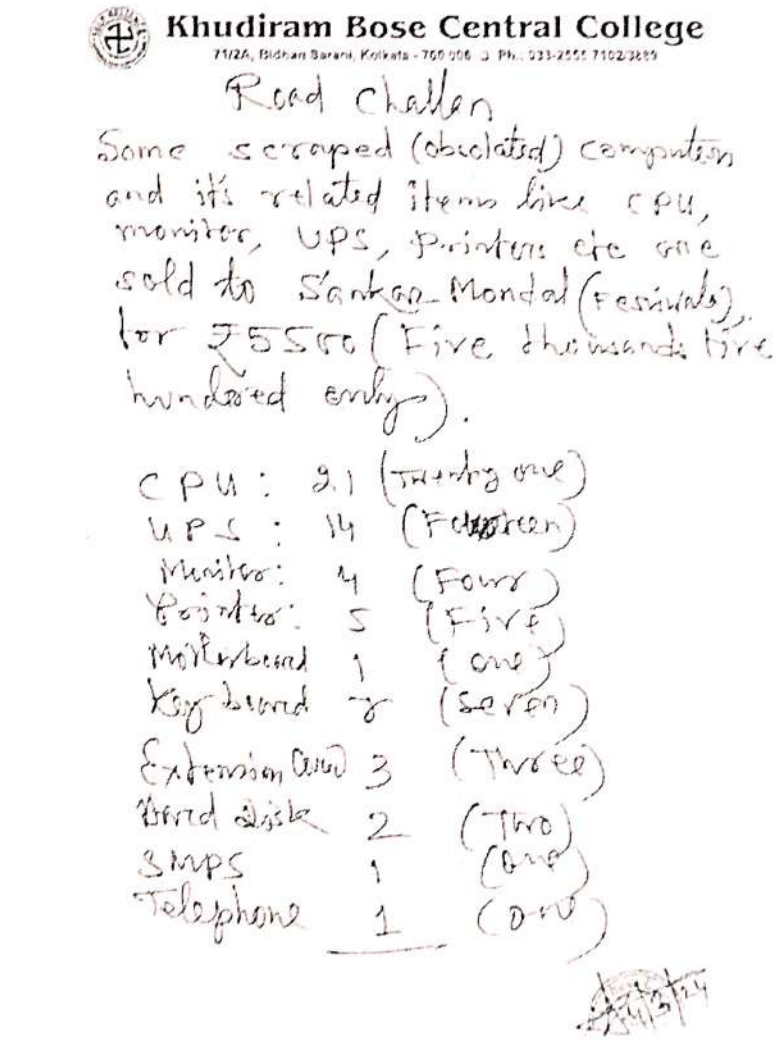
E-Waste

To quantify E-waste was a lesser task. Very little E-waste has been available. Any presence of both kinds of **electronic waste - IT** (like computer monitor, CPU, UPS,

printer, router, mother board, hard disc, keyboard etc.) and **consumable** (AC machine, refrigerator, water filter) was not seen in the waste bins, which were handled during quantification. Some electrical waste, particularly discarded electrical fan and electrical wires were found in the store room adjacent to the roof.

a. Electrical fan-15 kg
b. Electrical Wire-2 kg

It has been ascertained that recently a considerable amount of E-waste has been sold to one Sankar Mondal termed as feriwala (informal collector / trader) on 4 March 24. The related challan showing the items sold out is produced below.



Khudiram Bose Central College
71/2A, Bidhan Sarani, Kolkata - 700 006 ☐ Ph.: 033-2555 7102/3885

Road Challan

Some scraped (obsolated) computer and its related items like CPU, monitor, UPS, Printers etc are are sold to Sankar Mondal (Feriwala) for ₹5500 (Five thousand five hundred only).

CPU :	21	(Twenty one)
UPS :	14	(Fourteen)
Monitor:	4	(Four)
Printer:	5	(Five)
Motherboard	1	(one)
Key board	7	(seven)
Extension Cord	3	(Three)
Hard disk	2	(Two)
SMPS	1	(One)
Telephone	1	(One)

Old version of CRT – waiting to be declared obsolete within a short period – such CRT (monitor) are not produced now.

Apart from these, one cooler machine and one almirah were found at the ground floor. The security guard informed the team that those were ready for handing over to one such pheriwala (informal collector).

As ascertained from the office that many electrical and electronic equipment and items are purchased as and when required for the college. The necessary formalities for purchase are followed. A list of the major items purchased during 23-24 and 24-25 was handed over to the audit team. The list shows the following -

Sl. No.	Items	Price in Rs.	Approx Wt. in Kg
6.7.22	Camera	14344	2
6.7.22	Copying Machine	95000	35
15.7.22	Geography Equipment	51218	0.5
1.8.22	Air Cooler	89000	30
18.9.22	Sound System	20000	7
24.9.22	CCTV	6910	3.5
9.1.23	Computer	100000	2.5
6.2.23	Geography Department Computer	134000	7
6.2.23	Computer	126000	8.5
6.2.23	Computer (Principal's room)	31797	7.5
15.3.23	Refrigerator & Micro woven	22000	90
17.5.23	Computer	82000	6.5
	Total Approximate weight		**200**

It is estimated that total weight of E-items increases through new purchases by 15% every year. Again usually 10% of the E-equipment becomes obsolete every year. Projected quantity of E-waste in next 3 years may be estimated as -

Projected E-Waste in Kg			
	2024-2025	**2025-26**	**2026-27**
Year wise E-equipment	**230**	**265**	**305**
E-waste projected	**23**	**26.5**	**30.5**

Recommendations on E-Waste

- The practice of storing the E-waste separately is already in place. The practice needs to be continued.

- Care needs to be taken to reduce the amount of E-waste by purchasing quality items that last longer.

- Apparently, the college does not fall in the category of 'Bulk Consumer" and it is not obligatory to dispose of E-waste only through authorized collectors / recyclers. However, it will be ethical for the institution to transfer the E-waste to such formal recyclers at reasonable price to prevent the possibility of their informal recycling. Contacts of such authorized collectors / recyclers are available at the websites of WBPCB and CPCB.