

Green Audit Report

Dr. B.K.B. College, Puranigudam, Nagaon, 2020-2021



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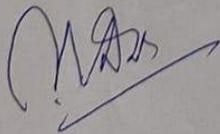
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External Auditor details:

Name of the Auditor : Chiranjeev Bezbaruah
Designation : Assistant Professor, Deptt. of Botany
Name of the Institution : Kaliabor College
Year of Experience : 19 years

Comments of the Auditor:

The campus is well maintained and has a good green cover but an effort is needed for waste disposal. Overall the campus is safe and conducive for students.



Principal
Dr. B.K.B. College
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Nagaon (Assam)

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External Auditor

External Auditor details:

Name of the Auditor: Chitransu Bezbaruah
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Name of Institution: Kaliabor college.
Year of Experience: 19 years.

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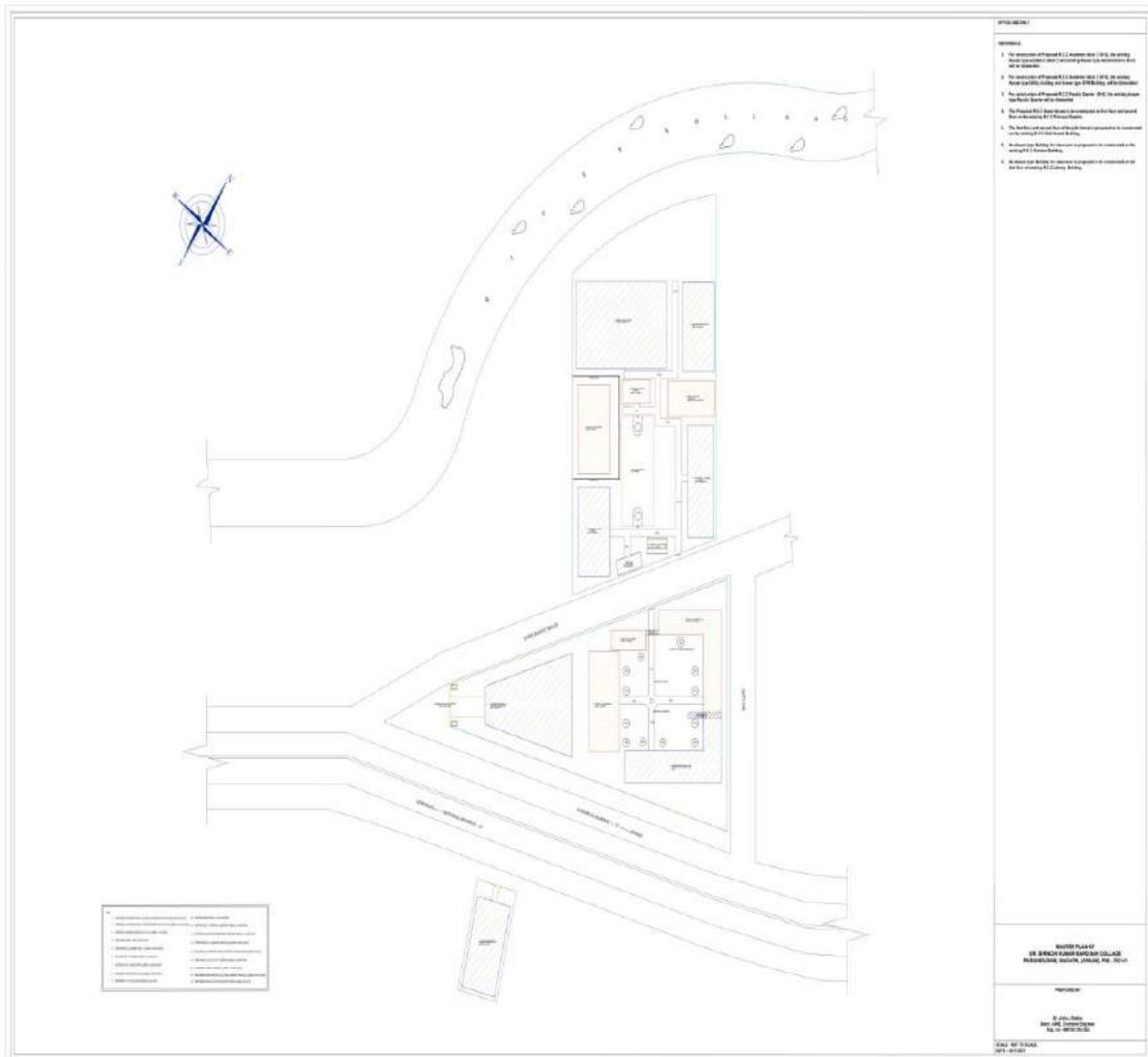


Principal
Dr. B.K.B. College
Puranigudam
Nagaon (Assam)

Chitransu Bezbaruah.
Auditor.

Introduction

Environmental audits are tools that companies and other organisations use to identify or define their full range of environment impacts and assess their institutions' compliance with applicable laws and regulations, as well as with the expectations of their various stake holders. They also serve as means to identify opportunities to save money, enhance work quality, improve employee health and safety, reduce liabilities, and achieve other forms of eco-friendly and conducive environment for an academic institution. The aim of Green Audit may be defined as an attempt to analyse the environmental practices within and outside the college and to assess its impact on the eco-friendly ambience as a whole. At a time when we are face to face with environmental degradation and ecological crisis, it has become essential for higher educational institutions, as well, to incorporate practices that would provide and promote the process of regeneration and sustainability. Green Audit can be said to be a seed for greater change and development for the future in this concern.



Map of the college: Dr. B.K.B. College

Objective of the Study

The main objective of the Green Audit is to promote the environment management and conservation in the college campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of environmental sustainability in accordance with the applicable regulations, policies and standards. The main objectives of the present study are:

- 1) To inculcate and create awareness among students and stakeholders towards the real concerns of environment and its sustainability.
- 2) To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use in the campus.
- 3) To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and possess high cost corrective measures.
- 4) To identify the current practices that can impact on the environment of the college campus.
- 5) To bring out a present status report on environmental compliance.

Methodology:

In the process of carrying out Green Audit the methodology applied included different tools such as, preparation of a format for data collection, physical inspection of the campus, observation and review of the documentation, measurements and recommendations. The area covered by the study to summarise the present status of environment management in the campus is Green Area Management.

Green Area Management

Tree diversity of Dr. B.K.B. College

The College campus is enriched with different tree species which are performing different ecological services. The various tree species of the college campus were planted during different periods with a view to implementing multiple plantation programs carried out from time to time. Those valuable tree species of the college campus have alleviated the quality of life of the entire college fraternity as well as the people living around the college campus by providing different environmental services. These include- the improved air quality, protection of soil erosion, controlling climate change and supporting wildlife. Animals of different types have been depending on these plants for their food and shelter. The leaves, fruits and flowers are being used by many animals, birds and insects for their life support. The old structure of these trees gives them an imposing quality. Those different plant species manifest different shapes, colour and texture. These perennial woody plants located in the college campus help in reducing unpleasant noise, dusty air and devastating storm. The recent study about the flora and fauna found available in the college campus exhibit the rich diversity of trees

with a large variety of species. Thus, the green belt of the college has been contributing significantly in maintaining the healthy environment of the entire area. The following are the different tree species with whom we are being attached to:

Table- 1
List of Plants in the college campus

Sl. No	Local Name	Scientific Name	Density
1	Bokul Tree	Mimusops elengi	1
2	Jamun Tree	Syzygium cumini	1
3	Bogori plant	Zizyphus jujube	4
4	Taro/kosu Plant	Colocasia esculenta	
5	Radhasura Plant	Caesalpinia pulcherrima	1
6	Teteli Tree	Tamarind	1
7	Guava	Psidium guajava	6
8	Aidin Plant	Adina	
9	Neem Tree	Azadirachta indica	1
10	Durun Plant	Leucas	
11	Dhekiya plant	Diplazium esculentum	
12	Krishnasura Tree	Royal poinciana	1
13	Rose plant	Rosa	7
14	Erica Palm	Dypsis lutescens	3
15	Lemon Tree	Citrus Limon	3
16	Haldi Plant	Curcuma longa	
17	TeakTree	Tectona grandis	3
18	Bogori Tree	Zizyphus jujube	1
19	Noroxingho Plant	Murraya koenigii	3
20	Coconut Tree	Cocos nucifera	1
21	Tulsi Plant	Ocimum tenuiflorum	20
22	Bel Tree	Aegle marmelos	1
23	Orange Tree	Citrus X sinensis	3
24	Amlokkhi Tree	Phyllanthus emblica	1
25	Betle Tree	Areca catechu	1
27	Silikha	Terminalia chebula	2
28	Koroi	Albizia procera	
29	Devadaru	Cedrus cedar	

Faunal Diversity

Dr. B.K.B. College situated in the Nagaon District of Assam is very rich in Bio Diversity. To conserve this bio diversity or first need is to learn about the existing diversity of the place without which a proper and feasible plan for conservation will not be possible. Also it is also important to have an understanding of the bio diversity of an area so that the local people can be aware of the richness of the bio diversity of the place they are living in and their responsibility to maintain that richness. In today's world,

among the popular conservation measures which are taken to spread wildlife and environmental awareness, butterfly gardens can be placed in a significant position. To create butterfly garden we need to know which associate plants and other fauna are present in the surrounding. This study allows us to understand the faunal and floral diversity of the surrounding areas of the college premises and their inter relationship. A large faunal species have been detected in the College Campus. The list of fauna indicates that the college campus is significantly rich in faunal diversity. We have seen a significant number of bird diversity and also seen different type of bird nests at many places. We have also taken photograph of some birds. This avian diversity indicates the healthy and balanced ecosystem for breeding, nesting and feeding ground for birds. The Kolong River flows beside the college campus. River systems are the zone of Earth's highest biological diversity- and also of our most intense human activity. Rivers are important habitats for a large variety of animals and plants. Fish, amphibians, birds, insects, invertebrates, and reptiles live in rivers, or find their food there. Rivers play a vital role in connecting habitats, and their value to plants and animals extends far beyond the surface area they cover. This habitat connectivity role functions both between upstream and downstream areas, and by connecting both sides of river banks. It has also been a very vital source of livelihood to the people living nearby. People resort to fishing either for self-consumption or as occupation. It has also been used for performing various day-to-day activities as well. The list of faunal diversity has been shown in table 2.

Table- 2
List of Birds and Animals around the College Campus

Sl. No	Local Name	Scientific Name
1	Monkey	Cercopithecidae
2	Goat	Capra aegagrus hircus
3	Cow	Bos Taurus
4	Hen	Gallus Gallus Domesticus
5	Rooster	Gallus Gallus
4	Duck	Anatidae
5	Dog	Canis Lupus Familiaries
6	Pigeon	Columbidae
7	Sparrow	Passeridae
8	Crow	Corvus
9	Dodo	Ruphus cacullatus
10	Dove	Columbidae
11	Crane	Gruidae
12	Myna	Acridotheres Tristis
13	Cuckoo Bird	Cuculidae
14	Woodpecker	Picidae
15	Goldfinch	Spinus tristis
16	Kingfisher	Alcedinidae
17	Eagle	Accipitridae

18	Kite	<i>Milvus migrans</i>
19	Blue Jay	<i>Cyanocitta cristata</i>
20	Parrot	Psittaciformes
21	Snakes	Serpentes
22	Rohu fish	<i>Labeo rohita</i>
23	Barali Fish	<i>Wallago Attu</i>
24	Kusiya Fish	<i>Mastacembelus armatus</i>
25	Bhokuwa Fish	<i>Labeo Catla</i>
26	Turtle	Testudines

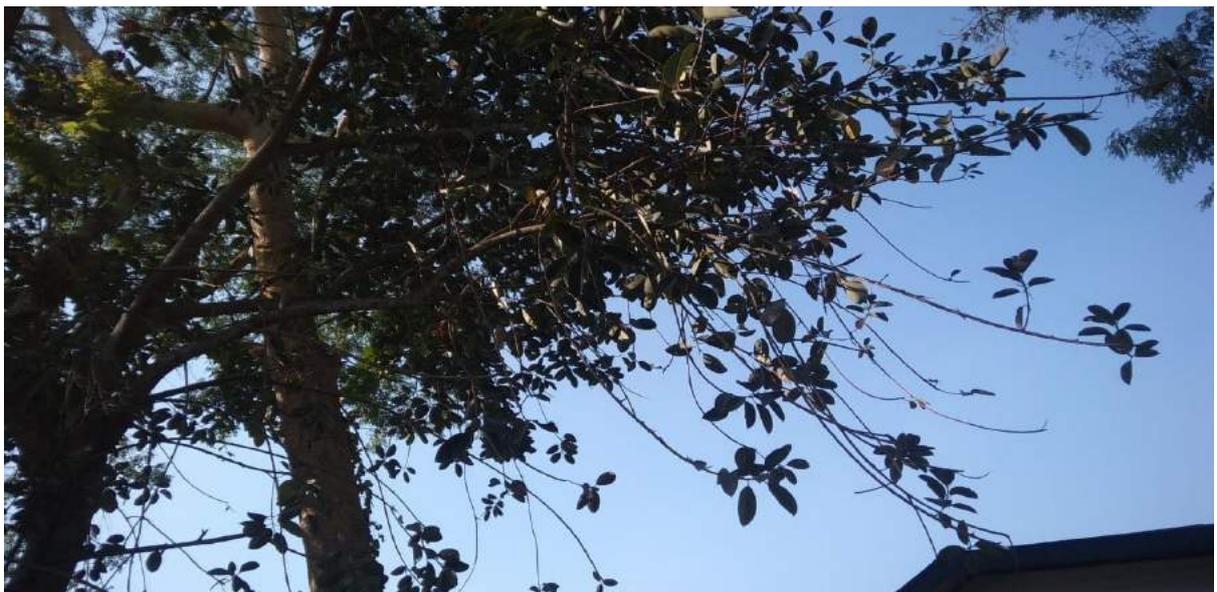
Photographs Attached:







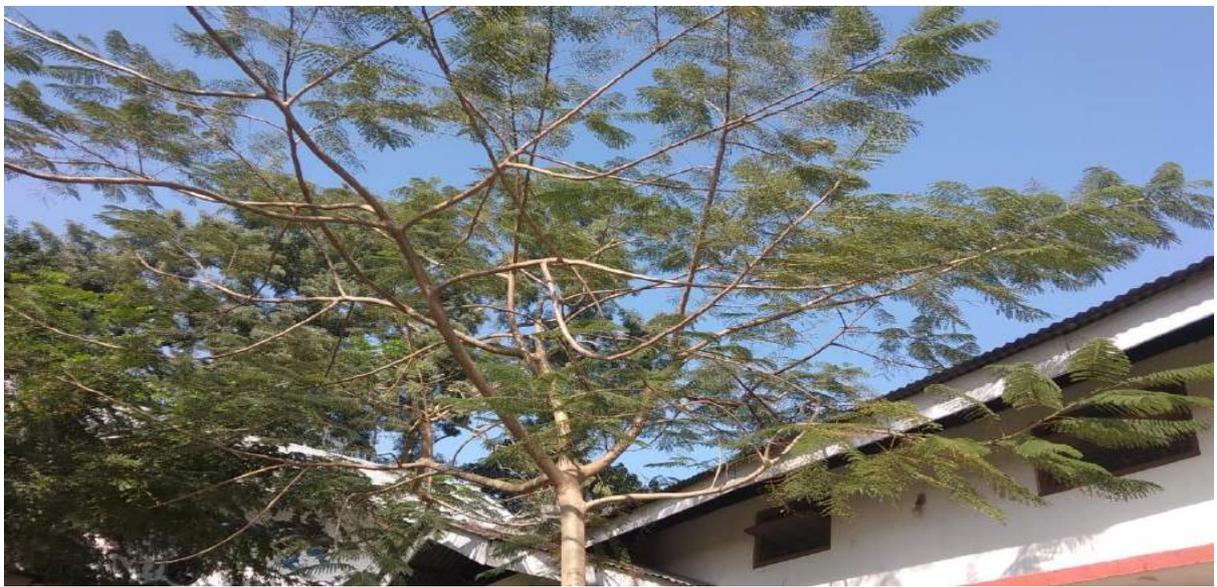


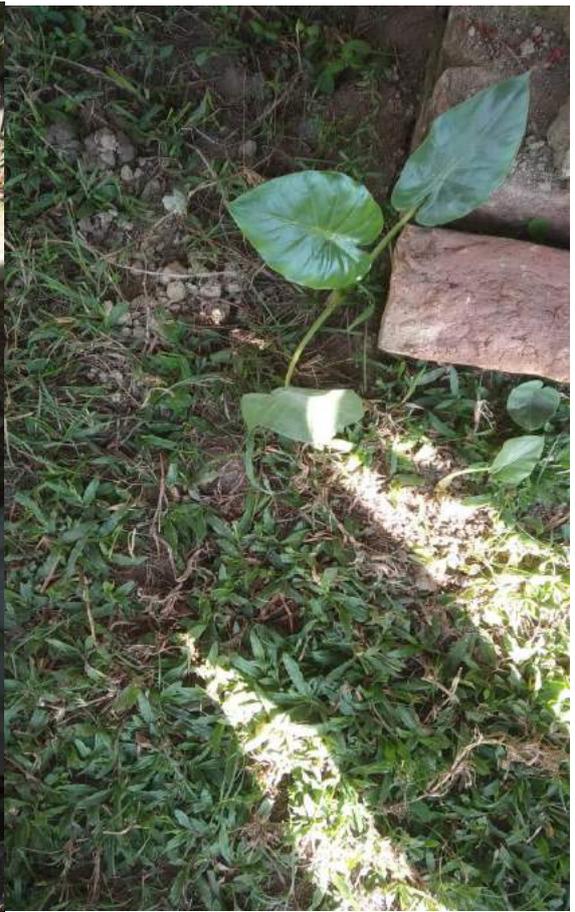


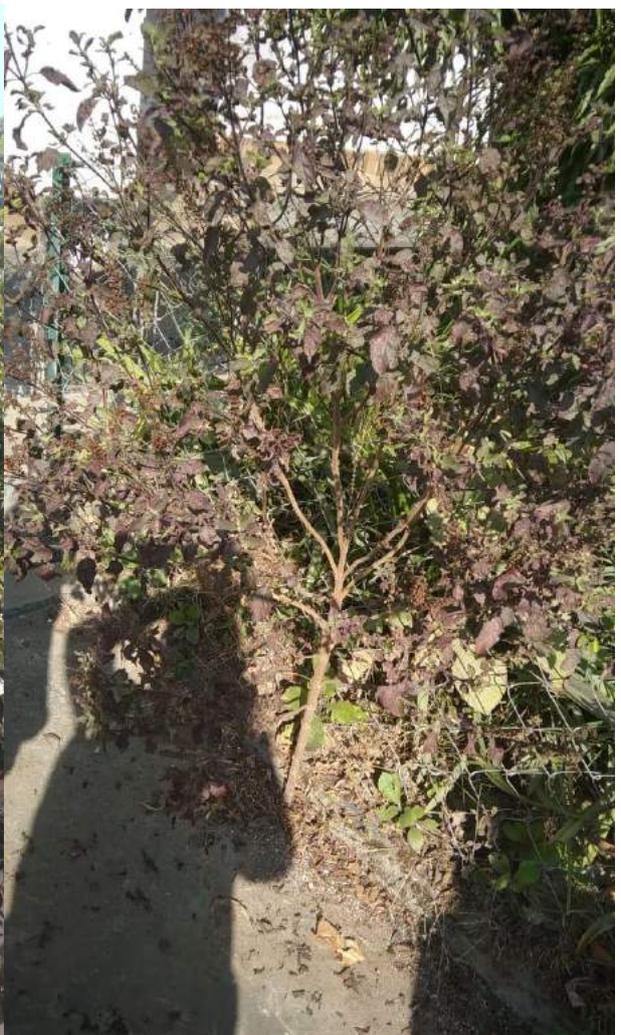




















Waste Management at Dr. BKB College

Waste is aesthetically unpleasant and can cause environmental degradation as well as health problems. Human activities generate waste and it is very essential that the wastes are collected, stored, handled and disposed of properly. Wastes are found in solid, liquid and E-waste forms. Solid wastes can be categorized into three types- biodegradable, non-biodegradable and hazardous waste. Biodegradable waste includes food wastes, canteen wastes and waste from toilets etc. Non-biodegradable waste includes plastics, tins, metal, glass, bottle etc. And hazardous waste includes chemicals, acids, petrol, diesel etc., which are likely to pose a threat to the health and environment. Unscientific management of these wastes through dumping in pits or burning them may cause the harmful discharge of contaminants into soil and water supplies and produce greenhouse gases contributing to global climate change. So, special attention should be taken for scientific management and handling of wastes generated in the college campus. Thus the minimization of waste is essential for sustainable environment of the college campus.

Sources of Waste Generation and status of wastes in the College Campus

Each and every academic department of the college along with the administrative offices, hostel, canteen, laboratories and library create different categories of waste such as solid waste, liquid waste, e-waste and hazardous waste in the college campus. To collect all these waste materials, 13 big dustbins are placed at different corners of the campus-1. Along with it, most of the departments keep their separate small dustbins inside the department and together all the wastes collected by the housekeeping/sweeper staff of the college on regular basis. On average, various stakeholders generate 48 kg of biodegradable wastes and 24 kg of non-biodegradable wastes per week and 60 kg of E-wastes per year. All the wastes are then dumped near the swamp behind the library and are burnt altogether. But there is no provision of dustbins for the wastes generated in Campus-2 of the college, and so the wastes are collected by the housekeeping/sweeper staff of the college and sometimes by the NCC cadres as well as the NSS volunteers. The wastes including plant litters are regularly collected and are burnt off at different spots. The E-wastes are put to optimal use and those which cannot be used or recycled are disposed off through vendors. A sanitary napkin incinerator machine is installed to dispose off the used sanitary napkin/pad. Proper drainage systems are laid out to collect the liquid waste from all sources and the outlet is properly connected to Kolong River from where it is discharged.

Survey Checklist for Waste Management System

1	Total number of students		
2	Total number of teaching staff		
3	Total number of non-teaching staff		
4	Which of the following are available in the college campus? Give the number.		
	a	Total number of garden	
	b	Number of garbage dumb	
	c	Number of big dust bin	
	d	Number of small dust bin	
	e	Number of laboratory	
	f	Number of canteen (kitchen)	
	g	Number of hostel (kitchen)	

	h	Number of staff quarter (kitchen)	
	i	Number of toilet	
5	Does the incumbent of the college generate any waste? If so what are these? Mention number and weight.		
	a	Solid waste (paper, plastic, metal, glass)	
	b	Liquid waste	
	c	E-waste	
	d	Hazardous waste	
	e	Unused equipment	
	f	Medical waste	
	g	Napkin	
	h	Any others	
6	Is there any waste management mechanism in the college?		
7	What is the approximate amount of waste generated per day/ per month?		
	a	Biodegradable wastes	
	b	Non-biodegradable waste	
	c	E-wastes	
8	What are the methods used to dispose the wastes generated in the college?		
	a	Composting	
	b	Recycling	
	c	Reusing	
	d	Any others	
9	Does the college authority use the recycled paper in the college?		
10	Can you achieve zero garbage in your college? If yes, how?		

Table-3

Table indicates the data/information gathered from various sources about waste generation and management

Total Stakeholders : 1199	a. Students: 1147 b. Teaching staff: 35 c. Non-teaching staff: 13 d. Canteen staff: 04
Number of canteen	01
Number of kitchen	03
Number of garden	07
Number of big dust bin	13
Number of small dustbin	18
Number of laboratory	03
Number of toilets	08
Bio-degradable waste (food wastes, canteen waste, toilet waste etc.)	Waste bins are placed at several points of the college to collect wastes by the cleaners and these are dumped inside the college campus.
Non-bio-degradable waste (paper, paper-plate, paper cup, plastic, glass, tin, metal etc.)	Big dustbins are placed in several points in the college campus and small dust bins are

	used by the stakeholders of different departments and administrative offices to collect the non-bio-degradable wastes for disposal by burning.
E-wastes (computers, electrical as well as electronic parts and ware)	Collected for storage in a store room and disposed by auction.
Unused equipments and damaged furniture	Disposal through vendor.
Bio-degradable waste (canteen, hostel, quarter and departments)	8 kg/day
Non-bio-degradable waste (canteen, hostel, quarter and departments)	4 kg/day
E-waste	5 kg/month

Few photographs of dust bin and waste management are attached:

























Water Management at Dr. B.K.B. College

Water body and its proper management is the primary perspective in relation to maintain a well structured hygienic atmosphere in the college premises. The administration of Dr. B.K.B. College has maintained the basic requirements of water management and provision of water facilities to all the students enrolled in all the semesters in every year. Starting from pure drinking water till usage of water in all the areas, the college administration has taken up adequate steps. The basic source of water used in the college premises is the groundwater that is conserved in water tanks and the bore well rainwater harvested in concrete tanks. The conserved water stored in all the available store-houses is widely used in the washrooms, in the water purifiers, in the flower gardens, in boys' and girls' common rooms, in the canteen, in the girls hostel etc. etc. Regarding drinking water, timely checking up of all the filters is arranged with adequate systems. Proper outlet in specific places and appropriate drainage are also systematized for releasing excess water (used water too) from the water tanks and taps. As a whole, the college has deliberately maintained a well-framed water management system in the premises.

Rainwater Harvesting

Rainwater harvesting is the collection of rainwater from a surface that allows for the rainwater to be stored and used at a later time. Rainwater can be harvested and stored for the use of landscape irrigation, potable and non-potable indoor / campus use, and storm water management. Harvested rainwater can be particularly useful when no other source of water supply is available, or if the available supply is inadequate or of poor quality. In the college premises of Dr. B.K.B. College, rainwater harvesting is started by fixing adequate pipes in the edges of the roof tins in one part of the college building. The rainwater collected through

this process is preserved in concrete wells / tanks having the capacity of approximately 2000 litres.

Table: 4

List of items and their accounts where water is utilized:

Sl No	Identity of item (Capacity/Size)	Total No.
1	Water tanks	08
2	Water pumps	05
3	Water purifiers	08
4	Water taps	35
5	Electronic motors	03
6	Washrooms	08

PHOTO GALLERY OF WATER MANAGEMENT:



Pic.1: Water tanks used for storing groundwater for using in different aspects.



Pic.2: Water purifiers used as source of pure drinking water



Pic.3: Groundwater tank used to store rainwater through piping



Pic.4: Pipes used in the edges of the roof of buildings to slope down the rainwater to the tank.

Energy Management at Dr. B.K.B. College

An assessment of energy consumption, energy sources used, energy management, lighting devices used and other appliances used by the college campus community is an important aspect of sustainability of the community. Hence this is a relevant aspect of the assessment. The audit team assessed the number of electrical appliances and their respective uses in terms of consumption of energy per month in KWh. This indicates the energy management of the campus. Based on the assessment we made suggestions and recommendations.

Table-5

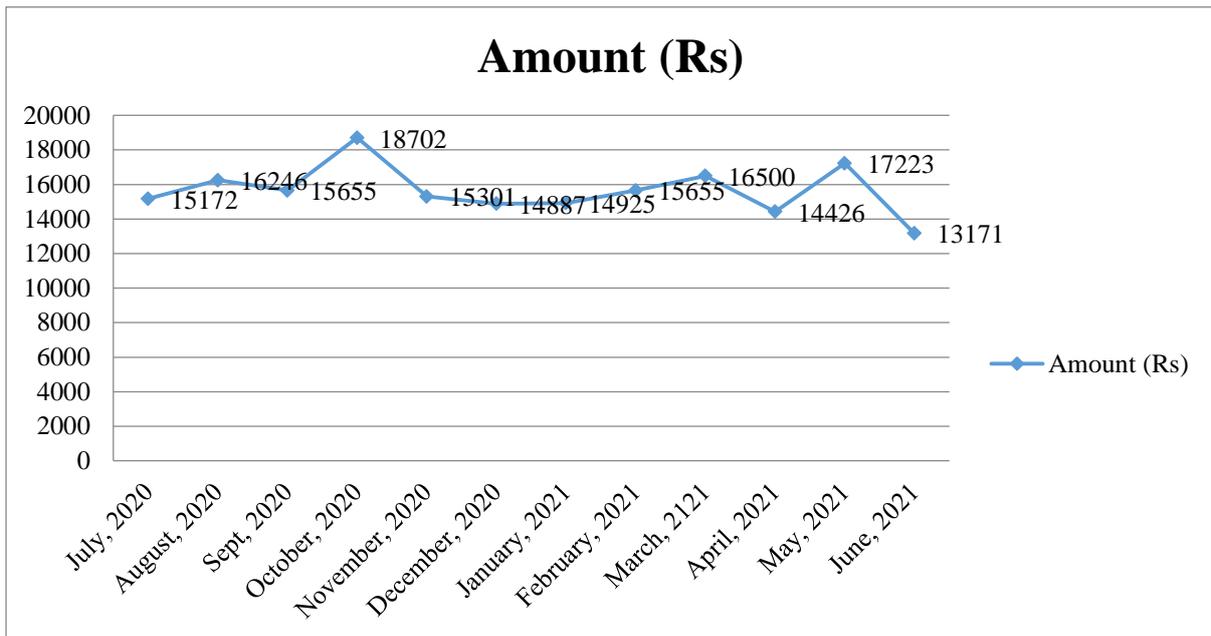
**Electrical Equipments in the College Campus and its Energy Consumption Capacity
(Average operation 6 hrs/ day)**

Sl. No.	Equipments	Number	Watts/Units	Whr	kWh	kWh (Month)
1	Tube Light	158	40	240	0.24	7.2
2	LED	126	25	150	0.15	4.5
3	Ceiling Fan	217	80	480	0.48	14.4
4	Projector	9	100	600	0.60	18
5	Printer	12	100	600	0.60	18
6	Xerox	2	1200	7200	7.20	216
7	Exhaust Fan	6	100	600	0.60	18
8	Focus Light	9	300	1800	1.80	54
9	Speaker	19	25	150	0.15	4.5
10	Air Conditioner	1	3000	18000	18.0	540
11	TV	3	230	1380	1.38	41.4
12	Fridge	3	1800	10800	10.8	324
13	Ro Plant	4	750	4500	4.50	135
15	Laptop	7	30	180	0.18	5.4
16	Desktop	59	120	720	0.72	21.6
17	Mixer Grinder	1	500	3000	3.00	90
18	Electric Kettle	2	1200	7200	7.20	216
19	Battery	2	100	600	0.60	18
20	Motor	6	1480	8880	8.88	266.4
21	Vacuum Cleaner	1	200	1200	1.20	36
22	CCTV	7	50	300	0.30	9
23	Podium	2	150	900	0.90	27
24	Table Fan	2	48	288	0.288	8.64
25	Street Light	5	95	570	0.57	17.1
26	Halogen light	2	90	540	0.54	16.2

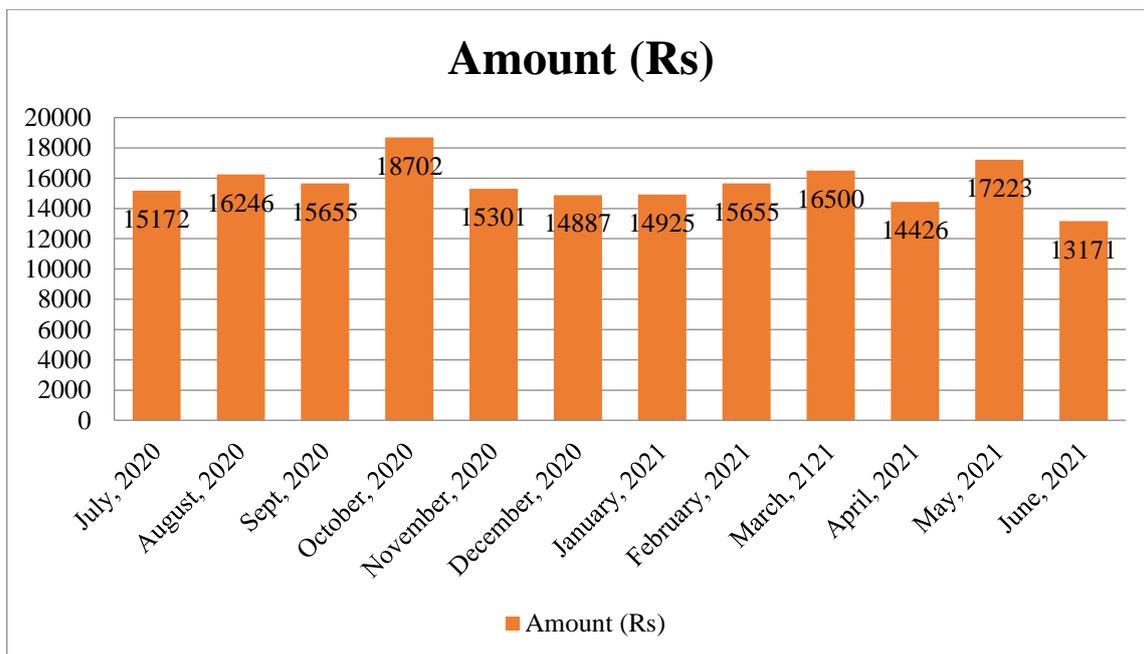
**Table- 6
Electricity Bills for the Academic Year 2020-21**

Sl. No	Month	Year	Consumption (KWH)	Amount (Rs)
1	July	2020	887.2	15172/-
2	August	2020	1026.3	16246/-
3	Sept	2020	952.23	15655/-
4	October	2020	1316.7	18702/-
5	November	2020	939.6	15301/-
6	December	2020	852.11	14887/-
7	January	2021	857.02	14925/-
8	February	2021	952.23	15655/-
9	March	2021	1032.76	16500/-
10	April	2021	844.31	14426/-
11	May	2021	1150.22	17223/-
12	June	2021	615.95	13171/-

Month wise Electricity Consumption Details



Month wise Electricity Bills



Observation on electricity bill analysis

1. The average monthly energy consumption of the college campus is 952.23 units.
2. Total monthly billing is Rs. 187863/-
3. Average unite rate is Rs. 7.35/-
4. Cost of generator fuel – Rs.1000/month.

Suggestions and Recommendations:

Bio-diversity

For balanced bio-diversity and ecosystem following recommendations are made-

- More plantation needs to be done in and around the campus.
- A new garden needs to be developed in the campus.
- Trees should be planted in the campus and also near the roads around the campus to minimise air pollution.
- Boundary walls need to be constructed along the roadside.

Waste Management

For well waste management following suggestions are given-

- Adequate number of big dust bin as well as small dust bin should be set up in the campus-2 of the college.
- A concrete waste disposal pit should be made as soon as possible for disposing the non-degradable waste of the college campus.
- A vermicompost pit should be made in the college campus for composting the bio-degradable waste of the college.
- Separate waste disposal dust bin should be set up in the various points of the college campus.
- Some MoU should be done with the local waste managing committees and/or with the municipal board of the nearby town.
- A Green Audit Cell should be formed.

Energy Management:

Following recommendations are made for eco-friendly energy consumption-

1. The college has not established the solar power plant yet in the campus. Solar energy is renewable energy source, its production and maintenance cost is almost zero and production of solar energy does not produce any kind of pollution. Therefore, the use of solar energy and establishment of solar plant will be beneficial from economical as well as environmental point of view.
2. Since for lighting a huge number of tube lights are being used in the campus, therefore, replacement of those tube lights by LED lights can help the institute to save a huge amount of electricity consumption.
3. The replacement of the street lights by solar lights can help the institute to save the electricity consumption as well.
4. Awareness can be created among the students for the efficient use of electricity in the college campus and signboards may be hanged in the college campus for the efficient use of electricity.

External Auditor details:

Name of the Auditor:

Designation:

Name of Institution:

Year of Experience:

Comments of the Auditor:
