GREEN AUDIT REPORT (2020-2023)

BRAHMANANDA KESHAB CHANDRA COLLEGE

111/2 B.T. ROAD, BONHOOGHLY, KOLKATA-700108

Swachhta Action Plan Committee
Brahmananda Keshab Chandra College
&
Green Audit team
Barrackpore Rastraguru Surendranath College
(IS0:14001)

Barrackpore Rastraguru Surendranath College

(With Autonomous Post Graduate Courses)

85, Middle Road and 6, Riverside Road, Barrackpore, Kolkata 700120

NAAC Re-accredited (3rd Cycle – Grade 'A'), DST-FIST Funded, DBT BOOST and Colleges with Potential for Excellence (CPE) awarded College.

Dr. Monojit Ray, *M Sc. Ph D. FICS*
Principal & Secretary

033-25945270
mail : brsc1953@gmail.com
website : www.brsnc.org

Ref :

Date : 04.08.2023

To whom it may concern

This is to certify that Barrackpore Rastraguru Surendranath College, an ISO 9001 & ISO 14001 certified Institution has conducted the Green Audit of Brahmananda Keshab Chandra College. It has also verified and authenticated the report of the same for the years 2020-2023.

(Dr. Monojit Ray)
Principal
BARRACKPORE
Rastraguru Surendranath College

GREEN AUDIT REPORT: 2020-2023

BRAHMANANDA KESHAB CHANDRA COLLEGE

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Dr. Sandip Pal
Assistant Professor
Department of Zoology
Barrackpore Rastraguru Surendranath College

Principal
BARRACKPORE
Rastraguru Surendranath College

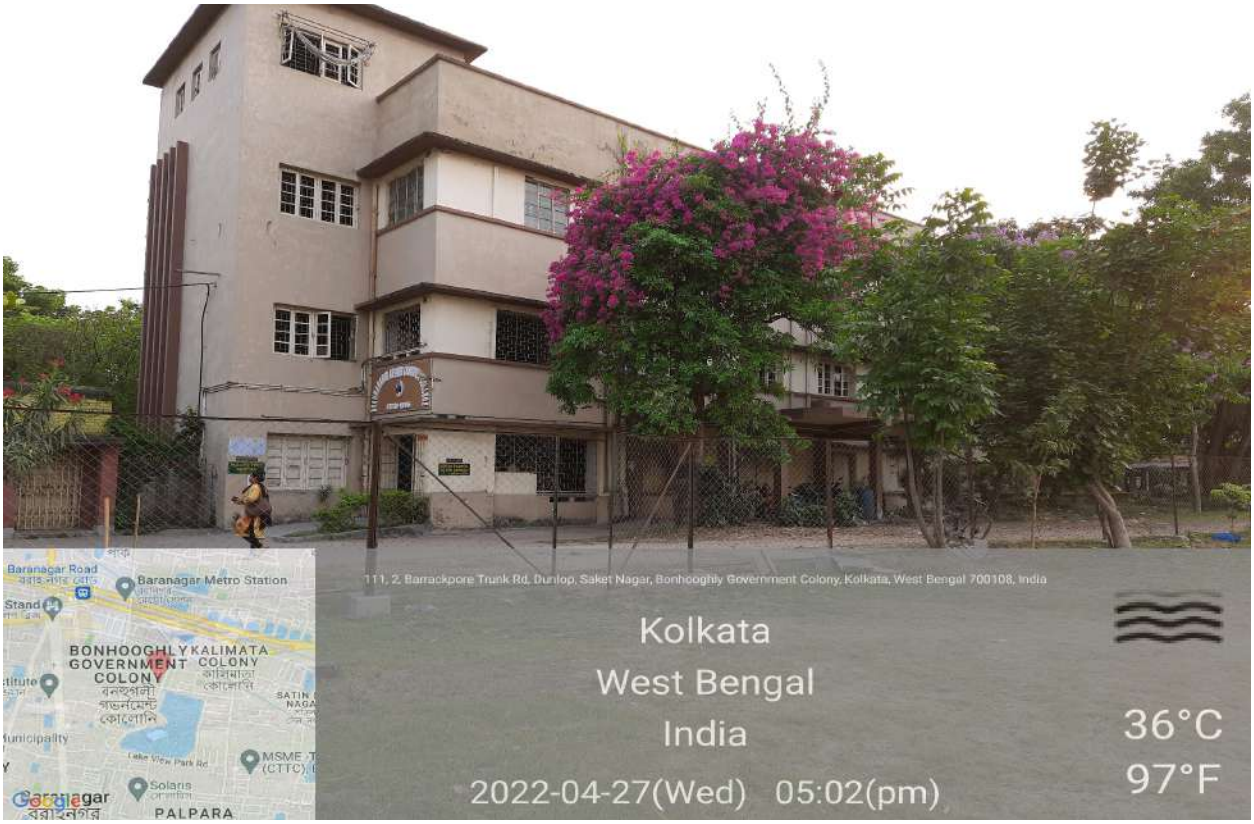
EXECUTIVE SUMMARY:

The rapid urbanization and economic development at local, regional and global scale has led to several environmental and ecological crises in the modern era. Eco campus is a concept rooted all over the world to make them sustainable because of their mass resource utilization and waste discharge into the environment. On this background it becomes essential to adopt the system and practices of the Green Campus for the institute which will lead for sustainable development. Brahmananda Keshab Chandra College is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental issues and reverse the trends as much as possible. Being a premier institution of higher learning, the college has initiated 'The Green Campus' recognition two years back that actively promotes the various projects for the environment protection and sustainability. The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. The methodology includes: preparation and filling up of questionnaires, physical inspection of the campus, observation and review of the documentation, interviewing key persons, data analysis, measurements and recommendations. It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit are to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on a student's health and affect college operational costs and the environment. The criteria, methods and recommendations used in the audit are based on the identified parameters.

Acknowledgement:

On behalf of Brahmananda Keshab Chandra College, Swachhta Action Plan Committee Coordinator Dr. Madhumita Roy is thankful to the Green Audit Assessment Team of Barrackpore Rastraguru Surendranath College for assisting this important work of Green Audit. We appreciate the cooperation extended to our team during the entire process. Our special thanks are due to the Principal (BRGSC) – Dr. Monojit Ray, IQAC Coordinator Dr. Sutapa Saha and Green Audit Team Supervisor Dr. Sandip Pal for giving us necessary inputs to carry out this very vital exercise of

Green Audit. We are also thankful to our Principal Dr. Papia Chakraborti and IQAC Coordinator Dr. Sheikh Ahmed Hossain for their continuous support and motivation. Sincere thanks is due for Dr. Aparajita Nag (Energy Management team leader, SAP Committee), Dr. Dipansu kumar Viswas (Water Management team leader, SAP Committee), Dr. Biswarupa Ghosh (Greenery Management team leader), Md. Mainul Islam(Waste Management team leader, SAP Committee), Smt. Nayna Guha Majumder (Sanitation and Hygiene team leader, SAP Committee), Dr. Amit Ray and Dr. Anirban Barman (NSS Programme Officers), and other staff members who were actively involved while collecting the data and conducting field measurements.



Brahmananda Keshab Chandra College

1. INTRODUCTION:

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyze environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Green Audit, one gets a direction as to how to improve the condition of the environment and there are various factors that have determined the growth by carrying out Green Audit. It is well known that educational institutions consume resources like water, electricity; Forest products and generate wastes like many industries. Establishment and operation of educational institutes are not covered by any of the environmental laws in India. As a result, the importance of making the educational institute operate with self-consciousness in the utility of resources inside the campus is least understood. Eco campus is a concept implemented in many educational institutes across the globe to make them sustainable because of their mass consumption of resources and creation of waste. Waste minimization plans inside the educational institute for solid and wastewater are now mandatory to maintain the cleanliness inside the campus. To find out the environmental performance of the educational institutions and to analyze the possible solutions for converting the educational campus as an eco-campus the conduction of Green Auditing of institutions is essential. Green audit is assigned to the criterion 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India and it declares the institutions as Grade A, B or C according to the scores assigned during the accreditation. This present report is for the year 2020 to 2022.

1.1 ABOUT THE COLLEGE:

This College is a Govt. of West Bengal Aided degree college affiliated to the West Bengal State University and upgraded from Bachelor's to Master's degree in the list of Colleges included u/s 2(f) and 12(b) of the UGC Act, 1956 vide UGC letter No. 8-104/2019(CPP-I/C) dated 17/12/2019. Currently the college is governed with 18 Under Graduate departments and three Post Graduate Departments. The institute is offering 3 years UG Programmes B. A. (Honours) in Bengali, Economics, English, History, Philosophy, Political Science, Sanskrit; B. A. (General) in Journalism & Mass Communication, Education; B. Sc. (Hons) in Botany, Chemistry, Economics, Industrial Fish & Fisheries, Mathematics, Physics, Zoology, B.Sc. (General) in Computer Science, Statistics

& Molecular Biology. The institute offers two years Post Graduate Courses M.Sc in Botany, Mathematics & Physics.

The college has been moving ahead, contributing to the cause of education, environment and society and hopes to do so in the years to come. Apart from academics, the students are always encouraged to nurture their hidden talents through various extracurricular activities. For the holistic development of the youth of today, apart from building their body and the mind amongst the eco-friendly sprawling green campus of the college over-viewing the Bon-Hooghly lake, we also encourage conservation of biodiversity through its sustainable development to save our Mother Nature. As our objective is advancement of learning accompanied by modern teaching aids, the campus is now Wi Fi enabled with digital classrooms. Also the library resources are enormous with a huge collection of books and journals.

MISSION and VISION:

Brahmananda Keshab Chandra College believes in imparting a holistic environment that works to foster a student's all-round growth and development. The College provides an environment that encourages critical learning, the preservation and transmission of knowledge and values and instills in students a sense of discipline and dynamism. Students are taught to develop an understanding and appreciation for the diverse worlds that they are a part of. The teaching learning process encourages innovative thinking and creativity among the students. Students graduating from the College are equipped to meet the challenges of an ever-changing world through a holistic model of education that works to inculcate in them a sense of social responsibility as well.

2. OBJECTIVES 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 the framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

- To introduce and make students aware of real concerns of the environment and its sustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in the environment that are more difficult to handle and their corrections require high cost.
- To bring out a status report on environmental compliance.

3. METHODOLOGIES:

In order to perform green audits, the methodology included different tools such as preparation of questionnaires, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarise the present status of environment management in the campus:

- Energy conservation
- Water management
- Waste management
- E-waste management
- Green area management

Total land area available on the campus and land use:

The measurements were done from the google earth map of the college campus to estimate different categories of area.

Total Land Area Occupied	
Description	**Area in Square Metres**
Constructed area	2,640

Green Area inside the boundary (Green area includes any area which has grass cover, tree cover and horticulture)	15,880
Unconstructed barren area or others	830
Total land area	19,350

Google earth image of the college campus

Inspection in Women Hostel

Inspection for rooftop Rainwater Harvesting

Certificate

सत्यमेव जयते

Where there is Rural Wellbeing there is Universal Prosperity

This is to certify that Brahmananda Keshab Chandra College, Kolkata, West Bengal is now a Recognized Social Entrepreneurship, Swachhta & Rural Engagement Cell (SES REC) Institution. The Institution has successfully framed the SES REC Action Plan and constituted ten working groups for improving facilities in the Campus and the Community/Adopted Villages in the areas of Sanitation & Hygiene, Waste Management, Water Management, Energy Conservation and Greenery post COVID-19, along with the observation of three environment, entrepreneurship and community engagement related days to inculcate in faculty, students and community, the practices of Mentoring, Social Responsibility, Swachhta and Care for Environment and Resources.

Date of Issue: 01-09-2020

Dr. W G Prasanna Kumar
Chairman

Mahatma Gandhi National Council of Rural Education
Department of Higher Education, Ministry of Education
Government of India

Certificate No.: MoE/SES REC/Kolkata/05

Certificate of Recognition of Swachh Campus from MGNCRE

4. OBSERVATIONS AND RECOMMENDATIONS:

4.1. ENERGY USE MANAGEMENT:

a) Observation:

Energy audits were done by the Energy Management team to estimate the total energy budget of the college.To reduce the carbon footprint, replacement of neon lights was done with energy efficient LED lights and low wattage fans particularly in large classrooms. 62 Solar power panels have been installed on the College rooftop as an alternative energy source and it started functioning on and from 10.12.2020 reducing electricity consumption. As a result Electricity bills of the college have been cut down to a great extent.

Sap energy Committee report 2021-22

1. Committee members met periodically to decide various activities of SAP energy Sub-Committee to be taken up in this period.

2. Audit on different electrical fittings of the college building including women's hostel was done in January 2022. It was observed that the number of energy saving LED lights had increased in the period 2021-22 both in the class rooms and hostel. It was also observed that normal tube lights were not replaced by LED lights in the library inspite of the recommendation of the committee.
3. The committee collected data from monthly electric bills of the college and found that units consumed do not reflect the solar energy generated by the solar panels fitted on the rooftop. This was reported to the college authority.
4. Student volunteers were inducted in the subcommittee in May 2022 and were asked to collect data from teaching and nonteaching staff of the college to get an idea about their mode of transportation while attending college.
5. Student volunteers were also instructed to prepare posters with quotes related to "save energy" and paste them in the classrooms for general display.
6. The student volunteers along with the committee members give constant effort to aware the stakeholders to save energy for the betterment of the college.

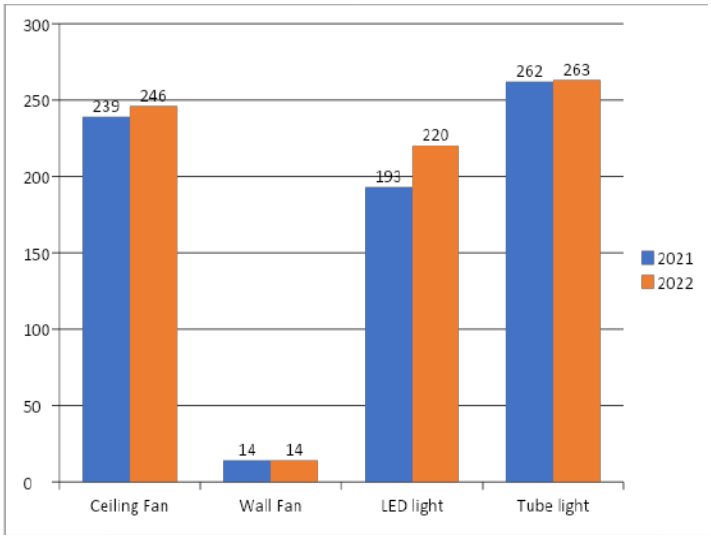
Sd/
Aparajita Nag
Convenor SAP Energy Subcommittee

Electrical Unit consumptions in College

Year 2019	Unit Consumed	Year 2020	Unit Consumed	Year 2021	Unit Consumed	Year 2022	Unit Consumed
Jan	2512	Jan	2042	Jan	1660	Jan	1354
Feb	2880	Feb	2567	Feb	1405	Feb	1314
March	2815	March	2906	March	2119	March	1955
April	3572	April	0	April	3314	April	3610
May	4246	May	10	May	2110	May	3326
June	4385	June	2002	June	3257	June	3237
July	-	July	2442	July	2019	July	3148
August	5249	August	3867	August	2349	August	3144
September	5218	September	2106	September	2543	September	3832

October	4401	October	2785	October	2419	October	1826
November	2864	November	2686	November	2153	November	1127*
December	4477	December	1630	December	1630	December	890*

***** low electricity consumption in winter months

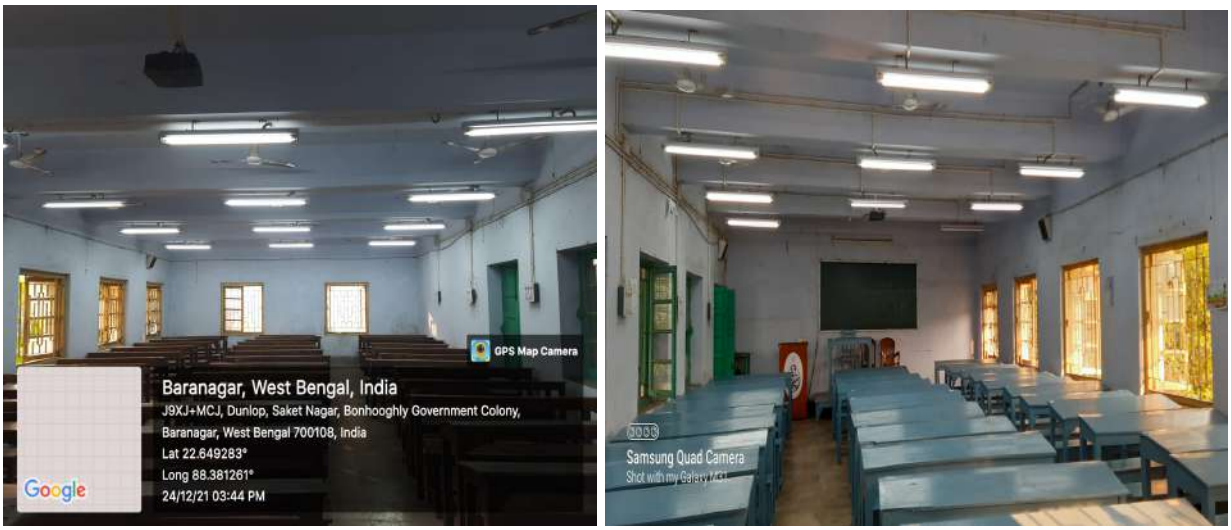


Comparative study of usage of electrical fittings in college and hostel in 2021 and 2022

Inspection of Solar Panels

Solar Panels on rooftop

Wheeling to Grid System



LED light Enabled Classrooms

4.2. WATER USAGE AND MANAGEMENT:

a) Observation

As per the suggestion of the Water Management team of SAP Committee, leaking taps and pipes are serviced and replaced on a regular basis to reduce the water wastage. Total water consumption of the college campus was also estimated through the audit. A webinar on 'Rainwater Harvesting and Recharging Aquifer for Groundwater Augmentation' was conducted, where eminent resource person Mr. Subrata Halder, Executive Engineer, Agri Irrigation, Department of Water Resources Investigation and Development, Government of West Bengal put forward different aspects of rain water harvesting - Possibilities and Implementation Methodologies. He also emphasizes Rooftop Rainwater Harvesting on campus and Ground Water Recharge. A perennial water pool is maintained in Jaanki Amal Sacred Grove for ground water recharge purposes. No significant amount of concrete covering is used throughout the college campus to augment groundwater recharge

Activity – **Steps to Conserve Water on Campus (2021)**

Water Sources Audit	**Response**
Number of water tanks on the campus	**8** [3 tanks with 1500L each + 5 tanks with 1000L each]
What are the water sources and their number; e.g. ■ Bore-wells ■ Municipal water taps	 **1(in girls' hostel building)** **2** Reservoirs each with 7000L capacity.

■ Canals	Water supply (4 times in each day) through canals from Kamarhati Water Tank, and Baranagar Water Treatment Plant
Number of times the tanks are filled	2 times per day
How much time does it take to fill each tank	1 hours for three interconnected tanks + 1 hrs for four interconnected tanks + ½ hr to fill one drinking water tank
How many rainwater harvesting pits are there on the campus?	Under process by Govt. of West Bengal
Is water recycled on the campus?	Yes, From Laboratories (except Chemistry Labs) to the Garden
Are there any leakages of pipelines or taps?	Prior to Lockdown the leakages are detected and repaired. No leakages were detected due to non-functioning of labs during the Covid-19 lockdown period. They will be taken care of when the College reopens.
Do all the faucets have a water efficient dispensing mechanism?	Identification of taps and installation of faucets are under the process
What kind of plants are there on the campus - those that need lots of water or those that can do with little watering?	Potted and seasonal flowering plants need lots of water, while trees like Acacia, Lagostemia, Palm, Arjun tree, etc. need little watering.
To clean the rooms and toilets, are chemical cleaners (phenyls) used or natural products?	Chemical cleaners (phenyls, Muriatic acid) used to clean rooms and toilets.

Assessment in brief:-

■ What is the capacity of the campus to harvest rainwater - including rooftops, open areas, roads?

Rooftop Rainwater Harvesting Set up under process with the help of Govt. Of WestBengal

Phone : 2577-5878

BRAHMANANDA KESHAB CHANDRA COLLEGE

(NAAC ACCREDITED GOVT. SPONSORED DEGREE COLLEGE FOR UG & PG)

111/2, BARRACKPORE TRUNK ROAD, BON-HOOGHLY, KOLKATA - 700108

Ref. 090/SAP/SWI,WB/SE(A-I) Date 12-08-2024

To
The Superintending Engineer(A-I),
S.W.I.Circle,
State Water Investigation Directorate,
Govt. of West Bengal,Bikash Bhaban
4th Fl, Salt Lake, Sector-II
Kolkata-700091

Subject: Implementation of Rainwater Harvesting cum Artificial Recharge to Groundwater Project at BKC College, Baranagar, Bonhooghly.

Respected Sir,

This is to bring to your kind attention that Brahmananda Keshab Chandra College is one of the pioneer Higher education Institutions situated at the heart of North Kolkata (Near Dunlop) and North 24 Parganas. We have a huge green campus area with the three storied main college building, new college building, three storied girls hostel and staff quarter. We need lots of water for toilet flashing and gardening uses all over the year. Our college has large open rooftop areas but can not manage to harvest rainwater as we do not have rain water harvesting setups in our college campus. As a result, we face water logging conditions every year during the rainy season in our college campus and locality; Intern we face water scarcity during summer months. Our college will be highly benefited if you arrange to set up a rainwater harvesting cum artificial groundwater recharge system in our college. Hoping for a positive response from your side.

Thanking you

Sincerely yours

Papia Chakraborti

(PAPIA CHAKRABORTI)
Principal
BKC College,
111/2, B.T Road, Bonhooghly,
Kolkata-700108

Principal
Brahmananda Keshab Chandra College
111/2, B. T. Road, Bon Hooghly
Kolkata-700108

Signage of Save Water

water Cooler

servicing of water purifier

Taps with faucets

Water purifier

Perennial water pool

4.3.WASTE GENERATION AND MANAGEMENT:

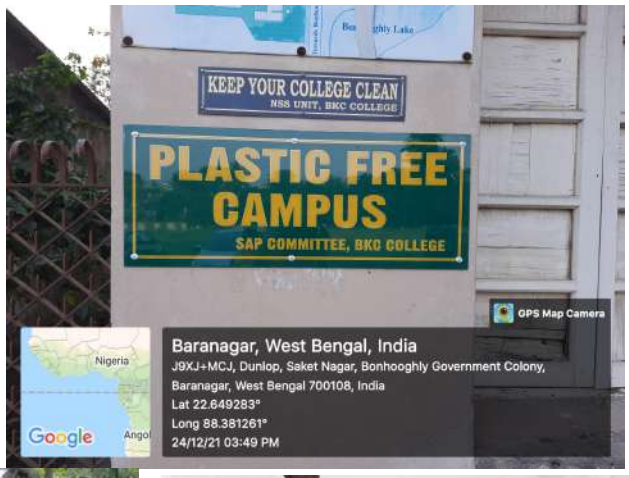
a) Observation

Clean Campus Drive and Solid Waste management:

Swachhta Action Plan Student Volunteers and NSS volunteers carried out activities like campus cleaning collecting non biodegradable solid waste from college campus to make it a litter free zone. Students prepared posters from recycled papers to display in relevant places in college buildings. Waste bins of different colours and labeling were placed for proper collection and segregation of solid wastes at source.

Plastic waste cleaning activity

Waste bin installation



Awareness outside campus

Organic waste management:

Compost pit for production of manure

- **Bioenzyme and biopesticide Production:**

Student volunteers from the Department of Zoology (Biodiversity Unit) prepare bioenzyme and biopesticide using recycled plastic containers in collaboration with WWF India as an Eco Project from organic waste materials like citrus fruit peels, Onion and Garlic peels and pack them in recycled water bottles. The products are used for gardening purposes.

Production and end product display

4.4: E-WASTE GENERATION AND MANAGEMENT:

a) Observation

E-waste generated in the campus is very less in quantity. The college has a total of 36-Computers & 02-laptops and 07 printers, 01-xerox machine & 01-Scanner in working condition. The cartridges of laser printers are refilled outside the college campus. The E- waste and defective item from the computer laboratory is being stored properly. Electronic waste material such as computers, Computer Peripherals, Printer, Scanner etc. can be handed over to the authorised organization/department, where they will be reused and recycled safely to protect our environment.

E-waste Disposal in collaboration with Hulladek recycling pvt. ltd

4.5. GREEN AREA AND GREENERY PRACTICES

a) Observation

The college has approximately 8651m² of playground covered by lush green grass. The unconstructed barren areas are 830 m², also mostly covered with grass, herbs and shrubs. According to the guidelines of SAP Committee college does not promote concrete roads and open areas with concrete ground. Our green campus not only soothes eyes and gives aesthetic pleasure but provides ample oxygen to the atmosphere and maintains ambient air quality of the college campus though it is located in a very congested urban area.

To reduce the carbon footprint some papers are being reused and most of the official work is done by using electronic and social media (email. whatsapp, facebook, youtube). Classes are being conducted both offline and online using ICT facilities and different social media platforms.

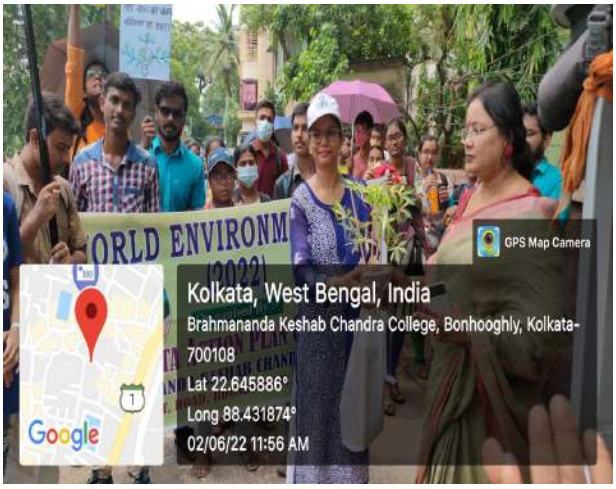
Brahmananda Keshab Chandra College has a rich biodiversity in its campus. Total Area of the college campus is about 6 Acres. The student volunteers of Swachhta Action Plan Committee (SAP) carry out the botanical inventorization of the flora growing in the campus at regular intervals under the supervision of the Greenery Team.Our College maintains the **'Janaki Ammal Sacred Grove'**, a natural forest patch and wetland corridor within the campus which has provided the required canopy cover for attaining the 'Green Champion' title. The 'Janaki Ammal Sacred' Grove in the college premises is the house of many Trees, Shrubs and medicinal plants

Green audits are done by the green team on a regular basis to register and maintain the plant diversity and increase the canopy cover on the college campus. Regular plantation drives by the NSS unit, SAP Greenery team, and the Eco-Club of the Botany department help to maintain plant diversity on campus. The status of different lifeforms(plants) recorded from the campus so far are 32 herbs, 12 shrubs and 30 tree species. Local resilient fruiting and flowering trees like mango, jackfruit, Guava, Star-apple, Lichi, chiku, black berry, wild almond, chalta, Amda, Star apple and Neem, Ficus, Jaarul, Gulmohor, Radhachuda, Amla, Bottle palm, Mehagani, Sisam, Palash, Bahera, Arjun, Shimul, Pipal etc. are being planted over years to maintain the faunal diversity as well. The lockdown along with the Amphan cyclone in 2020 had resulted in 80% invasion of the herbaceous cover by the invasive species *Sesbania sesban*. Post lockdown, the college administration under the supervision of the Green Team members of the SAP committee have successfully eradicated the invasive species before it reached the reproductive stage in its second generation.

Janaki Ammal Sacred Grove

World Environment Day, 2022

Plantation Drive on World Environment Day, 2022



Beyond campus environmental

Van Mahotsav, 2022

promotional activity

तारीख / Date: 05/08/2021
ज्ञापन संख्या / Memo no: MoE/SAP/WB/North24Parganas/ 195

सत्यमेव जयते

भारत सरकार / Government of India
महात्मा गांधी राष्ट्रीय ग्रामीण शिक्षा परिषद / Mahatma Gandhi National Council of Rural Education
उच्च शिक्षा विभाग/Department of Higher Education
शिक्षा मंत्रालय / Ministry of Education

Where there is Rural Wellbeing there is Universal Prosperity

District Green Champion Certificate

This is to certify that **Brahmananda Keshab Chandra College** is hereby recognized as **District Green Champion** for **North 24 Parganas** District for the Academic Year 2020-21. The Institution has successfully set up the Swachhta Action Plan Committee, adopted and implemented best practices in the areas of Sanitation, Hygiene, Waste Management, Water Management, Energy Management and Greenery Management.

This certificate is given in the presence of **Shri Abhra Adhikary, SDO Barrackpore, North 24 Parganas, West Bengal**.

AUGUST 2021

Dr W G Prasanna Kumar
Chairman
MGNCRE, Ministry of Education
Government of India

District Green Champion Certificate

4.6. BIODIVERSITY OF THE CAMPUS:

a) Observations:

Floral diversity of Brahmananda Keshab Chandra College:

The term “Green " means eco-friendly or not damaging the environment. This can acronymically be called as “Global Readiness in Ensuring Ecological Neutrality” (GREEN). Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. However, at college level documentation of the biological diversity of the campus gives an idea of the ecological footprint of the system. The college has rich plant diversity with 72 plant species; 28 tree species, 3 shrub species, 34 herbaceous species and 7 climber species (Table 1). The important tree species growing in the college premises were *Alstonia scholaris, Swetienia mahogani, Peltophorum pterocarpum, Phoenix dactylifera, Sterculia*

foetida, Terminalia arjuna, Dalbergia sisso, Terminalia catappa and others. These species constitute about 60 individual trees ranging from 10 cm to 270 cm girth. The college has a rich herbaceous diversity of around 45 species in various seasons of the year. Many of these wild species are medicinally important such as *Tinospora cordifolia, Eclipta alba, Stephania sp, Sida acuminate* and others.

The plant list of the college was prepared by collating the botanical documentation carried out by Eco-club members of the Botany Department during wet and dry season under the supervision of Dr. Biswarupa Ghosh from 2016 to 2022 (Plate 1-3).

Table 1: Plant diversity list of BKC College campus representing both wet and dry season.

Sl. no	*Name*	Family	Life form
1	***Bouganvillea sectabilis***	Nyctaginaceae	Climber
2	***Combretum indicum***	Combretaceae	Climber
3	***Cuscuta sp***	Convolvulaceae	Climber
4	***Mormordica diocia***	Cucurbitaceaea	Climber
5	***Stephania japonica***	Menispermaceae	Climber
6	***Tinospora cordifolia***	Menispermaceae	Climber
7	***Coccinia grandis***	Cucurbitaceaea	Climber
8	***Acalypha indica***	Euphorbiaceae	Herb
9	***Achyranthus aspera***	Amaranthaceae	Herb
10	***Ageratum conyzoides***	Asteraceae	Herb
11	***Alternanthera caracasana***	Amaranthaceae	Herb
12	***Amaranthus viridis***	Amaranthaceae	Herb
13	***Blumea lacera***	Asteraceae	Herb
14	***Boerhavia diffusa***	Nyctaginaceae	Herb
15	***Chozophora rottleri***	Euphorbiaceae	Herb
16	***Cleome viscosa***	Cleomaceae	Herb
17	***Colacassia esculenta***	Aracaceae	Herb
18	***Commelina bengalensis***	Commelinaceae	Herb
19	***Crotalaria juncea***	Fabaceae	Herb
20	***Eclipta alba***	Astercaeae	Herb
21	***Euphorbia tirucalli***	Euphorbiaceae	Herb
22	***Heliotropium sp***	Boraginaceae	Herb
23	***Leonurus sp***	Lamiaceae	Herb
24	***Lippia nodiflora***	Verbenaceae	Herb
25	***Malachra***	Malvaceae	Herb
26	***Oldenlandia***	Rubiaceaea	Herb
27	***Oxalis corniculata***	Oxalidaceae	Herb
28	***Parthenium sp***	Astercaceae	Herb
29	***Phyllanthus niruri***	Phyllantaceae	Herb

30	***Polygonum hydropiper***	Polygonaceae	Herb
31	***Pouzolzia zeylanica***	Utricaceae	Herb
32	***Rullea tuberosa***	Acanthaceae	Herb
33	***Rumex dentatus***	Polygonaceae	Herb
34	***Sesbania seban***	Fabaceae	Herb
35	***Sida rhombiodia***	Malvaceae	Herb
36	***Solnum torvum***	Solanaceae	Herb
37	***Sonchus asper***	Asteraceae	Herb
38	***Spilanthussp.***	Asteraceae	Herb
39	***Synendrella sp.***	Asteraceae	Herb
40	***Vernonia sp.***	Asterceae	Herb
41	***Xanthium strumarium***	Asterceae	Herb
42	***Caloptropis procera***	Apocynaceae	Shrub
43	***Ixora sp***	Rubiaceae	Shrub
44	***Riccinus communis***	Euphorbiaceae	Shrub
45	***Azdaractha indica***	Meliaceae	Tree
46	***Albezia lebbek***	Fabaceae	Tree
47	***Alstonia scholaris***	Apocynaceae	Tree
48	***Artocarpus heterophyllus***	Moraceaea	Tree
49	***Butea monosperma***	Fabaceae	Tree
50	***Cassia fistula***	Fabaceae	Tree
51	***Cassia javanica***	Fabaceae	Tree
52	***Ceiba pentandra***	Malvaceae	Tree
53	***Dalbergia sisso***	Fabaceae	Tree
54	***Delonix regia***	Fabaceae	Tree
55	***Dillenia indica***	Dileniaceae	Tree
56	***Ficus benghalensis***	Moraceaea	Tree
57	***Ficus hispida***	Moraceaea	Tree
58	***Lagerstroemia speciosa***	Lythraceae	tree
59	***Melia azadractha***	Meliaceae	Tree
60	***Mimusops elengi***	Sapotaceae	Tree
61	***Nerium sp***	Apocyanaceae	Tree
62	***Peltophoram pterocarpum***	Fabaceae	Tree
63	***Phoenix dactylifera***	Arecaceae	Tree
64	***Phyllanthus emblica***	Phyllantaceae	Tree
65	***Pongamia sp.***	Fabaceae	Tree
66	***Psidium guajava***	Myrtaceae	Tree
67	***Roytsonea regia***	Arecaceae	Tree
68	***Sterculia foetida***	Malvaceae	Tree
69	***Swetenia mahogani***	Meliaceae	Tree
70	***Sygigium sp.***	Myrtaceae	Tree
71	***Terminalia arjuna***	Combretaceae	Tree
72	***Terminalia cattapa***	Combretaceae	Tree

73	***Trema orientale***	Cannabaceae	Tree
74	***Mangifera indica***	Anacardiaceae	Tree

Plate 1. Botanical Documentation by the Eco Club, Botany Department, BKC College.

The Eco-Club Botany Department has also carried out a phytosociological study of the 'Janaki Ammal Scared Grove' established in 2016 as a biodiversity conservation site in the college premises. The sacred grove is a sanctuary for plants, migratory birds and other animals throughout the year. The Basal Area of the tree species in the sacred grove was calculated to understand the ecological services that the sacred grove provides. Basal area of trees is a common term used to describe the average area (usually in acre) occupied by tree stems. It is defined as the total cross-sectional area of all stems in a stand measured at breast height, and expressed as per unit of land area (typically square feet per acre).

A quadrat analysis of four 10 x10 sq. m. quadrate was carried out for estimating the basal area of tree species growing in the sacred grove. The quadrate study showed that 13 tree species having a total of 30 individuals occupied an area of 6249 sq ft or 0.144 acre land of the sacred grove (Fig 1). The most dominant species recorded were *Peltophorum pterocarpum*, *Albizzia leebeck* and *Ficus bengalensis*.

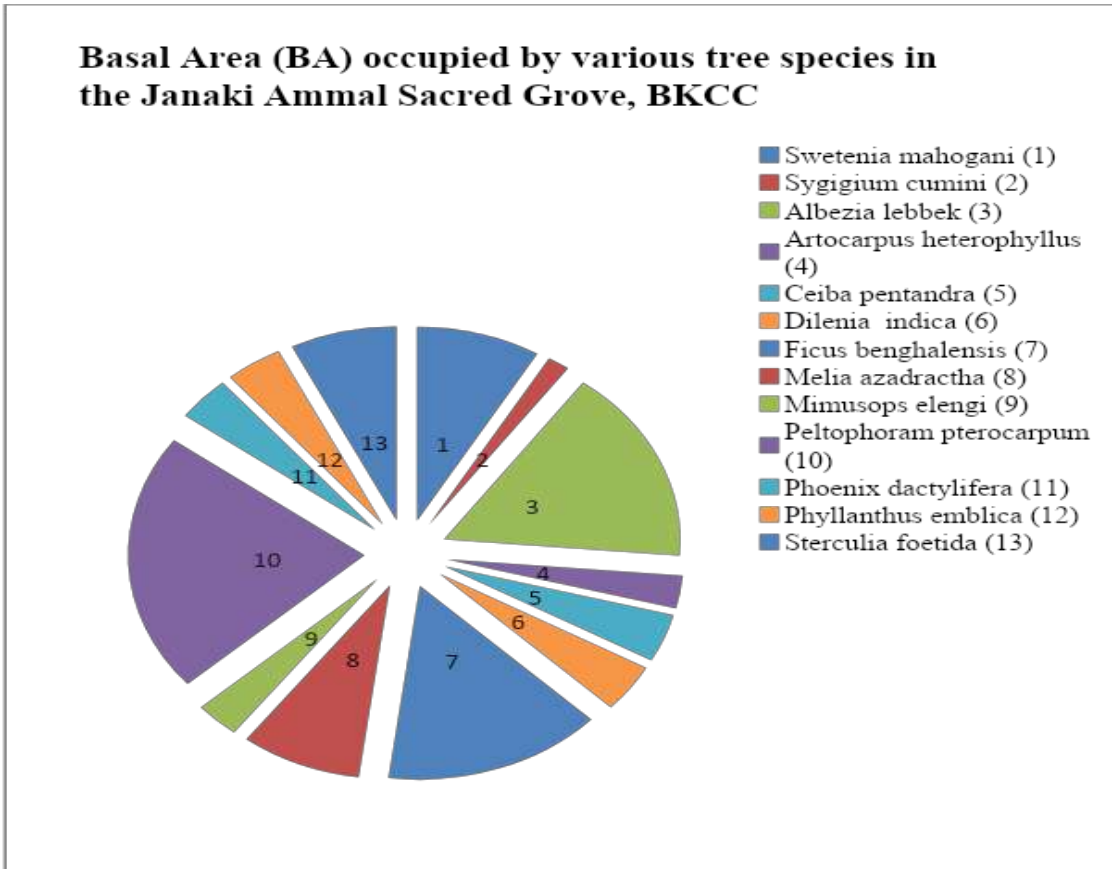


Figure 1: Basal area and Relative Dominance of Trees in the Janaki Ammal Sacred Grove of BKC College campus.

The number of trees in the sacred grove represents 50% of the total number of trees in the entire campus. The rest of campus is covered with wild trees, shrubs, herbs and ornamental plants. The playground of the college not only provides good health for the students and surrounding children it also remains green throughout the year. Thus the green campus of the college contributes significantly to minimize the ecological footprint on the surrounding environment.

Faunal Checklist of BKC College Campus

Prepared by
Dr. Madhumita Roy & Dr. Santanu Debnath
Year 2019-2023
Department of Zoology
BKC College

Amphibian Checklist of BKC College Campus

Sl. No.	Common name	Scientific name	IUCN status
1	Asian common toad	*Duttaphrynus melanostictus*	LC*
2	Indian bull frog	*Rana tigrina*	LC
3	Indian cricket frog	*Rana limnocharis*	LC

Note: *LC: Least concern

Reptilian Checklist of BKC College Campus

Sl. No.	Common name	Local name	Scientific name	IUCN status
1	Common house lizard	Tiktiki	*Hemidactylus flaviviridis*	LC*
2	Oriental garden lizard	Girgiti	*Calotes versicolor*	NE
3	Many-keeled Grass Skink	Arjina	*Mabuya carinata*	LC
4	Bengal monitor	Gosap	*Varanus begalensis*	LC
5	Buff striped keelback	Hele sap	*Amphiesma stolatum*	NE
6	Rainbow water snake	Metuli	*Enhydris enhydris*	LC
7	Indian rat snake	Daras	*Ptyas mucosus*	NE
8	Asiatic water snake	Jaldhora	*Xenochrophis piscator*	NE
9	Indian wolf snake	Gharchiti	*Lycodon aulicus*	NE
10	Indian cobra	Gokhuro	*Naja naja*	LC
11	Banded krait	Sankhamuti	*Bungarus fasciatus*	LC
12	Russell's Viper	chandrabora	*Vipera russelli*	LC
13	Monocled cobra	*Aalkeute*	*Naja kaouthia*	LC

Note: *LC: Least concern; **NE:** Not evaluated;.

Avian Checklist of BKC College Campus

Sl. No.	Common Name	Scientific Name	Family	IUCN status	Status
1	Little Egret	*Egretta garzetta*	Ardeidae	LC*	R#
2	Intermediate Egret	*Ardea intermedia*	Ardeidae	LC	R
3	Cattle Egret	*Bubulcus ibis*	Ardeidae	LC	R
4	Indian Pond Heron	*Ardeola grayii*	Ardeidae	LC	R
5	Black Crowned Night Heron	*Nycticorax nycticorax*	Ardeidae	LC	R
6	Little Cormorant	*Phalacrocorax niger*	Phalacrocoracidae	LC	R
7	Bronze Winged Jacana	*Metopidius indicus*	Jacanidae	LC	R
8	White Breasted Water-hen	*Amaurornis phoenicurus*	Rallidae	LC	R
9	Common Kingfisher	*Alcedo atthis*	Alcedinidae	LC	R
10	White Throated Kingfisher	*Halcyon smyrnensis*	Alcedinidae	LC	R
11	Pied kingfisher	*Ceryle rudis*	Alcedinidae	LC	R
12	Stork Billed Kingfisher	*Pelargopsis capensis*	Alcedinidae	LC	R
13	Common Flameback	*Dinopium javanense*	Picidae	LC	R
14	Black Rumped Flameback	*Dinopium benghalense*	Picidae	LC	R
15	Fulvous Breasted Woodpecker	*Dendrocopos macei*	Picidae	LC	R
16	Rufous Woodpecker	*Celeus brachyurus*	Picidae	LC	R

17	Coppersmith Barbet	*Megalaima haemacephala*	Megalaimidae	LC	R
18	Lineated Barbet	*Megalaima lineata*	Megalaimidae	LC	R
19	Blue Throated Barbet	*Megalaima asiatica*	Megalaimidae	LC	R
20	White Throated Fantail	*Rhipidura albicollis*	Rhipiduridae	LC	R
21	Common Iora	*Aegithina tiphia*	Aegithinidae	LC	RM
22	Black Drongo	*Dicrurus macrocercus*	Dicruridae	LC	R
23	Brown shrike	*Lanius cristatus*	Laniidae	LC	M
24	Long Tailed Shrike	*Lanius schach*	Laniidae	LC	RM
25	Indian Cuckoo	*Cuculus micropterus*	Cuculidae	LC	R
26	Common Hawk Cuckoo	*Hierococcyx varius*	Cuculidae	LC	R
27	Asian Koel	*Eudynamys scolopaceus*	Cuculidae	LC	R
28	Green Bee-Eater	*Merops orientalis*	Meropidae	LC	R
29	Chestnut-headed Bee-eater	*Merops leschenaulti*	Meropidae	LC	R
30	Rose ringed Parakeet	*Psittacula krameri*	Psittaculidae	LC	R
31	Greater Coucal	*Centropus sinensis*	Cuculidae	LC	R
32	Spotted Dove	*Spilopelia chinensis*	Columbidae	LC	R
33	Emerald Dove	*Chalcophaps indica*	Columbidae	LC	R
34	Yellow Footed Green pigeon	*Treron phoenicoptera*	Columbidae	LC	R
35	Black Kite	*Milvus migrans*	Accipitridae	LC	R
36	Red-Vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	LC	R
37	Red-Whiskered Bulbul	*Pycnonotus jocosus*	Pycnonotidae	LC	R

38	Common Tailor Bird	*Orthotomus sutorius*	Cisticolidae	LC	R
39	Purple Sunbird	*Nectarinia asiatica*	Nectariniidae	LC	R
40	Purple Rumped Sunbird	*Nectarinia zeylonica*	Nectariniidae	LC	R
41	Common Myna	*Acridotheres tristis*	Sturnidae	LC	R
42	Jungle Myna	*Acridotheres fuscus*	Sturnidae	LC	R
43	Oriental White Eye	*Zosterops palpebrosus*	Zosteropidae	LC	R
44	White Wagtail	*Motacilla alba*	Motacillidae	LC	RM
45	White Browed Wagtail	*Motacilla maderaspatensis*	Motacillidae	LC	R
46	Scaly Breasted Munia	*Lonchura punctulata*	Estrildidae	LC	R
47	Spotted owlet	*Athene brama*	Strigidae	NT	R
48	Black-hooded oriole	*Oriolus xanthornus*	Oriolidae	LC	R
49	Indian Golden Oriole	*Oriolus kundoo*	Oriolidae	LC	RM
50	Indian House Crow	*Corvus splendens*	Corvidae	LC	R
51	Indian Jungle Crow	*Corvus culminatus*	Corvidae	LC	R
52	Rufous treepie	*Dendrocitta vagabunda*	Corvidae	LC	R
53	House Sparrow	*Passer domesticus*	Passeridae	LC	R
54	Oriental Magpie-Robin	*saularis*	Muscicapidae	LC	R
55	Indian Paradise Flycatcher	*Terpsiphone paradisi*	Monarchidae	LC	RM/M

Note: *LC: Least concern; **NT:** Near threatened. [#]**R:** Resident; **RM:** Resident but local movements observed; **M:** Migratory.

Mammalian Checklist of BKC College Campus

Sl. No.	Common name	Local name	Scientific name	IUCN status
1	Little Indian field mouse	Metho indur	*Mus booduga*	LC*
2	Flat-haired Mouse	Nengti indur	*Mus platythrix*	LC
3	Indian mole-rat	Dhere indur	*Bandicota bengalensis*	LC
4	Greater bandicoot Rat	Indur	*Bandicota indica*	LC
5	Asian house shrew	Chucho	*Suncus murinus*	LC
6	Indian grey mongoose	Beji	*Herpestes edwardsii*	LC
7	Indian Golden jackal	Khaksial	*Canis aureus*	LC
8	Asian palm civet	Bham	*Paradoxurus hermaphroditus*	LC
9	Five-striped palm squirrel	Kath-berali	*Funambulus pennantii*	LC
10	Indian pipistrelle	Chamchika	*Pipistrellus coromandra*	LC
11	Indian flying fox	Badur	*Pteropus giganteus*	LC

Note: *LC: Least concern.

4.6. SOUND QUALITY MONITORING IN THE CAMPUS:

Date:17.07.2023

Equipment used: Sound Level Meter (Lutron SL4050)

Sl.No.	Place/Location	Noise level average value (dB)
1	Zoology staffroom	81.03
2	Main entrance	73.17
3	Library	59.77
4	Classroom (running) room No.-105	73.90
5	Classroom (empty) room no.-101	63.57
6	Principal's Room	62.33
7	Janaki Ammal Sacred Grove	62.67
8	Field	62.07
9	Central staffroom	82.00
10	Canteen	68.70
11	Women Hostel	59.80
12	Staff Quarter	65.20

- **Monitoring done by Dr. Sandip Mandal, Green Audit Team Leader (BRGSC).**

Sound Monitoring

5. Suggestions and Recommendations:

1. The unique feature of the college is the presence of 'Janaki Amal Sacred Grove'. Since it is confined to limited space, proper maintenance is required to preserve the biodiversity of the Grove.
2. The biodiversity resource of the college is quite high. Keeping this in mind, set up and maintenance of a butterfly garden may be practiced.
3. Few compact waste segregation bins may be installed in various places inside the college campus for proper segregation of solid .
4. Waste water treatment plant may be installed so that after treatment the recycled water may be used for toilet flushing and ground water recharge
5. The college campus is no doubt biodiversity but more plantations especially medicinal plantations are required in the campus. Plantation of fruiting plants will attract more birds.
6. The Green Monitoring Team should consist of members from teaching staff, non-teaching staff, students and if possible, some local interested people may be incorporated.
7. Vermicomposting facilities may be practiced to reduce solid organic disposable waste in the college campus. After the complete process of composting, the product can be used as manure in the garden and lawns.
8. Water quality assessment, especially the physicochemical and microbiological aspect of tap water and drinking water sources of the college campus is recommended.
9. Use reusable resources and containers and avoid unnecessary packaging where possible. Always purchase recycled resources where these are both suitable and available. Sustainable use of resources and ecological balance of the college campus must be maintained throughout the year.

6. CONCLUSION:

Considering the fact that the institution is predominantly an undergraduate as well as post graduate college, there is significant environmental awareness both by faculties and students and initiatives taken by them are substantial. The installation of 62 solar panels, paperless work system, composting and use of energy efficient lights and fans, environmental awareness programmes initiated by the administration shows how the campus is going to be green. Few recommendations are added for waste management using eco friendly and scientific techniques. As part of a green audit of the campus, we carried out the environmental monitoring of the campus including Noise level, quality of the classroom, library, play ground, canteen and students common room. Noise level in the campus is well within the limit. There is restricted entry of automobiles in the college campus.College has a separate parking zone for vehicles. Dead leaves of trees are decomposed and used as organic fertilizer. Earth Day, Van Mahotsav and World Environment Day are observed and celebrated to spread awareness about Green India. Planting a variety of trees has contributed to carbon neutrality on the campus. This may lead to the prosperous future in the context of Green Campus and thus sustainable environment and community development.

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