GREEN AUDIT REPORT

DON BOSCO INSTITUTE OF TECHNOLOGY

DON BOSCO INSTITUTE OF TECHNOLOGY

KUMBALAGOUDU, MYSORE ROAD BENGALURU - 560074

Audited by

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EXECUTIVE SUMMARY

Sustainability is not only spoken in various levels but also practiced by industries, organizations and educational institutes to optimize their resource utilization and make them environment friendly. Hence sustainability is the need of the hour for our country to provide our future generation a clean and safe environment. Educational institutions must play an active role in creating and modeling solution for such environmental problems. Green audit is one such concept or principle introduced to make the educational institutes environmentally sustainable. Through green audit one gets a direction as how to improve the condition of environment within the system. Green audit can be a useful tool for a college to determine how and where they are consuming more of energy or water or resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan.

Green auditing and the implementation of mitigation measures is a win-win situation for the college, the learners and the planet. It can also create health

consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of green impact on campus. Green auditing promotes financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility to the students and teachers.

In **Don Bosco Institute of Technology**, Bengaluru the audit process involved initial interviews with management to clarify policies, activities, records and the co-operation of staff and student in the implementation of mitigation measures. This was followed by staff and student interviews, collection of data through the questionnaire, review of records, observation of practices and observable outcomes. In addition, the approach ensured that the management and staff are active participants in the green auditing process in the college.

The baseline data prepared for the Don Bosco Institute of Technology will be a useful tool for campus greening, resource management, planning of future projects, and a document for implementation of sustainable development of the institution. Existing data will allow the college to compare its programs and operations with those of peer institutions, identify areas in need of improvement, and prioritize the implementation of future projects. We expect that the management will be committed to implement the green audit recommendations.

CHAPTER 1. INTRODUCTION

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience.

Green audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus, it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

1.1. OBJECTIVES OF GREEN AUDIT

The Green Audit of an institution is becoming a paramount important these days for self-assessment of the institution, which reflects the role of the institution in mitigating the present environmental problems. The college has been putting efforts to keep the environment clean since its inception. But the auditing of this non-scholastic effort of the college has not been documented. Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

The main aim objectives of this green audit are to assess the environmental quality and the management strategies being implemented in Don Bosco Institute of Technology.

The specific objectives are:

1. To assess the source and quantity and of the water in the Don Bosco Institute of Technology campus
2. To know and monitor the energy consumption pattern in the campus
3. To quantify the liquid and solid waste generation and management plans in the campus.
4. To assess the carbon foot print of the Campus
5. To impart environment management plans to the campus and college

Benefits of Green Audit to an Educational Institute:

- There are many advantages of green audit to an Educational Institute:
- It would help to protect the environment in and around the campus.
- Recognize the cost saving methods through waste minimization and energy conservation.
- Find out the prevailing and forthcoming complications.
- Empower the organization to frame a better environmental performance.
- It portrays good image of institution through its clean and green campus.

NAAC criteria VII Environmental Consciousness:

Universities are playing a key role in development of human resources worldwide. Higher education institutes campus run various activities with aim to percolate the knowledge along with practical dimension among the society. Likewise different technological problems higher education institutes also try to give solution for issues related to environment. Different types of evolutionary methods are used to assess the problem concerning environment. It includes Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Carbon Footprint Mapping, Green audit etc.

National Assessment and Accreditation Council (NAAC) which is a self-governing organization that declares the institutions as Grade according to the scores assigned at the time of accreditation of the institution. Green Audit has become mandatory procedure for educational institutes under Criterion VII of NAAC. The intention of green audit is to upgrade the environmental condition inside and around the institution. It is performed by considering environmental parameters like water and wastewater accounting, energy conservation, waste management, air, noise monitoring etc. for making the institutions more eco-friendly.

Students are the major strength of any academic institution. Practicing green actions in any educational institution will inculcate the good habit of caring natural resources in students. Many environmental activities like Plantation and Nurturing saplings and trees, Cleanliness drives, Bird watching camps, No vehicle day, Rain water harvesting, etc. will make the students good citizen of the country. Through Green Audit, higher educational institutions can ensure that they contribute towards the reduction of Global warming through Carbon Footprint reduction measures.

CHAPTER 2. DON BOSCO INSTITUTE OF TECHNOLOGY

2.1. ABOUT DON BOSCO INSTITUTE OF TECHNOLOGY

Don Bosco Institute of Technology since its inception in 2001, has built a reputation for having set high benchmarks in quality and commitment. The premier institute, which is affiliated to VTU, Belagavi, enriches the landscape of technical education by offering UG (BE) Programmes in Computer Science, Information Science, Electronics and Communication, Electrical and Electronics, Telecommunication, Mechanical and Civil Engineering. It also offers an MBA Programme.

Don Bosco Institute of Technology is having highly motivated faculty members, with excellent academic credentials and vast experience, work closely with the students to enhance their learning abilities and mentor them to achieve academic excellence in addition to acquiring sound knowledge. The faculty members keep themselves updated by acquiring higher academic qualifications and skill improvement.

DBIT has all the state-of-the-art infrastructure such as Spacious and Smart Classrooms, Well -equipped Laboratories, Skill Development Centre, PLM Training Centre, Kuka Robotics and several Incubation Centres to provide a superior learning experience to the students.

Industry interaction is an integral part of the Institution culture. Also, students are encouraged to participate in training programmes, guest lectures, personality development programmes so that they are industry-ready. DBIT always extends support for research and innovative activities to tap the inherent skills of staff/students and to give shape to their indigenous ideas.

A dedicated Training and Placement Cell takes care of the recruitment of the eligible students. Many top-notch companies have recruited our students. The Placement Cell also provides career guidance to students.

VISION

Don Bosco Bangalore to be a distinguished center of Excellence to Nurture and transform the talent of Millions through Quality and Value based education in the areas of Technology, Management and Sciences through its Innovative facilities of Higher learning towards human Excellence.

MISSION

To create a distinguished destination where in Personal, Intellectual and Professional Qualities of the students, to be strengthened through partnering with the Industry, Government and Professional bodies through Collaborative efforts.

CORE VALUES

Every Institute aspires to inspire students and scholars to achieve excellence; it is more or less the driving force of a successful institution. An Institute goes beyond conformity when its approach to inspiring students changes with the time. The norms, requisites and standards of educating the leaders of tomorrow are changing dynamically and it is imperative for a institution to keep up with the times to ensure a radical difference in the landscape of education.

On that Principle, the Core Values and Purpose of DBIT is to:

- Attain excellence in different disciplines by creating, preserving and disseminating knowledge to all aspiring students
- Draw inspiration from the Institutions ethos and develop within its members a sense of accountability towards their community, society and the nation at large
- Accept the challenges globalization and changing times throw at us to

offer high quality education and developmental services in a competitive manner

- Provide every opportunity to the Institutions key constituents–its faculty, staff, students and the community–to excel in their domain of expertise and contribute to every task with sincerity
- Transition from the teacher – centric focus to the learner - centric approach in imparting knowledge

2.2 INFRASTRUCTURAL FACILITIES

The Clean and Green Campus of DBIT, spread over an area of more than 30 acres, is strategically located off a Six-Lane National Highway, but free of pollution due to the sufficient spacing and advantageous orientation. It is fully Wi-Fi enabled with a Captive power back-up. Banking Facility/ATM Counters, Online Tuition Fee/Exam Fee Payment Facility, Free Yoga Classes, Organized Outings for Students and Hostelites are the other features. The various facilities are:

AUDITORIUM / SEMINAR HALL

DBIT - seminar halls are well ventilated with a minimum of 150 seating capacity each are available in the campus. They are well equipped with audio and visual systems.

The DBIT campus is always abuzz with several events such as Inauguration of First Year Classes, Orientation Programmes, Fresher's Parties, Cultural and Literary Meets/Performances, Felicitation Functions, Alumni Get-togethers, Institution/Departmental Level Meetings/Deliberations, Parent-Teacher-Mentor Meetings, Training and Placement Procedures, Distinction Awards Ceremony, Graduation Ceremony and many more.

The Institute has an Indoor Auditorium and several Seminar Halls to cater to the various activities that are a regular feature of occurrence. They are of seating capacities:

- Indoor Auditorium: 500 Seating Capacity
- Seminar Hall 1: 150 Seating Capacity
- Seminar Hall 2: 150 Seating Capacity
- Seminar Hall 3: 125 Seating Capacity
- Seminar Hall MBA: 120 Seating Capacity

For larger gatherings such as:

- DISTINCTION AWARDS CEREMONY – Mega Celebration of Academic Excellence with the participation of Students/Staff Members/Parents/Guardians.
- GRADUATION CEREMONY - Mega Celebration of Academic Excellence exclusively for the Latest Alumni with the participation of Staff Members/Parents/Guardians.
- National Festivals such as Independence Day, Republic Day and Gandhi Jayanti – the solemn events that are attended by all the Students and Staff of DBIT.
- VISMAY – The Cultural Festival of DBIT – Inter-Collegiate Cultural Extravaganza with an average attendance of about 1200 spectators,
- KANNADOTHSAVA - The State Festival celebrated with much fervour and attracting an audience of about 1500
- elaborate arrangements including – Heavy Duty Fans and Air Coolers, Safe and Secure Modular Auditorium, Comfortable Seating with an Unobstructed View of the Stage, Hygienic Food Stalls, Multiple Backdrops, Illumination/Psychedelic Lighting with Exclusive Power Back-up, Drone Coverage/Surveillance and Additional Security Personnel are made at the Open-Air Amphitheatre.

BOARD ROOM

This state of the art Board Rooms which are used for Meetings, Seminars, Presentations, video-conferencing and as a media Centre. Features a smart podium with a touch panel control system, PC and laptop connection, document camera, DVD/VCR Player, projector, and screen and also have an overhear transparency projector.

HEALTH CENTRE AT DBIT

A well-equipped Health Centre/Dispensary/Pharmacy is available for medical care on the campus. A medical professional and a paramedical staff are available during normal working hours with arrangements for immediate response 24x7. Tie-ups for Ambulance Service-on Demand are in place. In case of any emergency, the affected person/s are shifted to the neighbouring Speciality Hospitals/Medical Centres – with which a cordial relationship exists - for further treatment.

The Health Centre of the Don Bosco Institute of Technology provides health care to the institute community comprising of staff, students and campus residents. The institute community can avail treatment for all minor ailments/sudden ill-health.

A preliminary health check-up of all students and staff is done at the beginning of the academic year. Height, Weight, Blood Group and Basic Parameters such as Haemoglobin, Blood Sugar check-up are done and if necessary treatment/counselling is

ROOMS OF RESIDENCE

The Separate Residence hostels for Girls and Boys, every rooms has attached Bathrooms and RO Water for drinking with Solar Hot water facility. Both Hostels has reading room with newspaper & magazines with 24 hrs. Water / Electricity and Standby Generator.

DBIT HOSTELS:

Don Bosco Institute of Technology Hostels - a home away from home, offers on-campus accommodation for the bonafide students. Sufficient number of beds are available in the exclusive girls' block and the exclusive boys' block which are in totally different locations for the sake of privacy. The facilities provided are guided strictly by the sense of comfort and quality of living of the students. The Two Floor spacious Canteen, with an exclusive Lift to transfer Food between the floors, caters to the Mess requirements of the Hostels.

Adequate RO Water dispensing units, Hot Water facility, Reading room, Round the clock Water/Electricity with Stand-by Generator are in place.

Regular Health Checkups for resident students and hostel staff are arranged. Medical aid is made available 24x7 at the DBIT Health Centre. A Sick Room, each in the Girls Hostel and Boys Hostel, is provided for any emergency.

SECURITY SYSTEM:

The elaborate security arrangement with CCTV – covering every nook and corner of the campus - is manned 24 hours along with continuous monitoring. Entry into the campus/various departments/hostels is highly restricted. Special care is taken to depute only women for the Girls Hostel. Experienced On-Campus Wardens and Department-wise Coordinators look into the representations/concerns of the Hostelites.

TRANSPORTATION:

The students and staff of DGBI are provided with adequate transportation arrangements. The fleet of buses/mini-buses/MUVs connect all the prominent

localities places of Bengaluru with the institute. The facility is also available to Ramanagara/Channapatna and beyond. The experienced drivers have earned the appreciation of one and all over the years.

GYM AND FITNESS:

The Department of Physical Education and Sports of DBIT boasts of One of the Best Facilities among all engineering colleges of the state - thanks to the sprawling campus. Numerous inter - collegiate / inter – Institution / professional events are conducted on the campus regularly. The appreciation earned from VTU authorities / participating teams / other institutions and a large number of prizes/medals won by the students of DBIT are apt indicators of the encouragement and support given for Sports. Regular Fitness Programmes / Awareness Campaigns are a regular feature augmented by the excellent Gym Infrastructure.

DIGITAL CLASS ROOMS AND LABORATORIES:

All the departments have Lecture Capture Classrooms to automatically record and make available on-demand the complete session. The adaptive and secure videos can be consumed live or on-demand from the web and mobile applications. Students are provided the necessary login permissions to access the lectures from wherever they are at any time convenient to them.

Every department has the most sophisticated Laboratories with more than the requisite equipment/hardware/instruments/software/testing facilities to cater to both the learning and innovation needs. Our Lab instructors have much higher qualifications than required and many of them have industrial experience as well.

LIBRARY AND INFORMATION SERVICE:

The Library of DBIT is the hub of information resources. We procure the resources in electronic form, in addition to the conventional print form for fulfilling all the information needs of the user community. We offer an enormous wealth of information both on and off-campus by way of subscription to the e-resources of VTU Consortium. The library has more than 69,000 volumes of books and subscriptions to important printed periodicals, magazines, newspapers, and many e-resources and technology tools facilitate the academic and research activities of all stakeholders. National and International Conferences, Seminars, Workshops, and also Information Literacy Programmes are organized to create awareness among students about competitive examinations in the public and private sectors.

Location:

The library is situated on the ground floor of the Main Academic Block, spread over an area of about 1200 square metres. It is well-ventilated with natural light and provides a conducive ambiance for about 250 persons. The library has well-trained staff to support and serve the user community effectively.

Footprints:

The library was established in the year 2001 and formally inaugurated in the year 2004 by Dr. Raja Ramanna, Former Director, BARC, and veteran nuclear scientist of India. The library was named Dr. Raja Ramanna Center for Knowledge Resources in honour of his contribution to the nation and respectful memory of his visit to DBIT.

DEPARTMENT OF PHYSICAL EDUCATION AND SPORTS

The Department of Physical Education and Sports, established in 2001, is a cell of major activity on the Campus. The Department has secured the Envious Distinction of a place in the Top 10 Positions in Sports and Games among all Engineering Colleges affiliated to VTU during the Years 2011-12 and 2016-17. The award also fetched an amount of Rs.1,00,000/- on each occasion.

The department provides training in various Modern and Traditional Indian Games and provides opportunities to participate in various competitions inside and outside the campus. It has organized National/All India Institution/Inter-Institution/South Zone Inter-Institution/State/Inter-Zonal/Zonal/District Tournaments and Selection Trials as extramural activities to create awareness of several games and improve the personality of the students.

It is well equipped with modern infrastructure facilities to conduct cater to Basketball, Volleyball, Badminton, Table Tennis, Cricket, Handball, Softball, Judo, Football, Netball, Chess, Carrom, Athletics and Martial Arts.

OTHER CAMPUS FEATURES

The DBIT has big Clean & Green Campus, Wi Fi Campus facility, evening Free Yoga Classes, Banking Facility with ATM Counter inside the campus, Online Fee payment, Organized outing for girls Residents students.

2.3 COURSES OFFERED

UNDERGRADUATE PROGRAMS

- Artificial Intelligence and Data Science
- Artificial Intelligence and Machine Learning

- Civil Engineering
- Computer Science and Engineering
- Electronics and Communication Engineering
- Information Science and Engineering
- Mechanical Engineering
- Electrical and Electronics Engineering

POST GRADUATE PROGRAMES

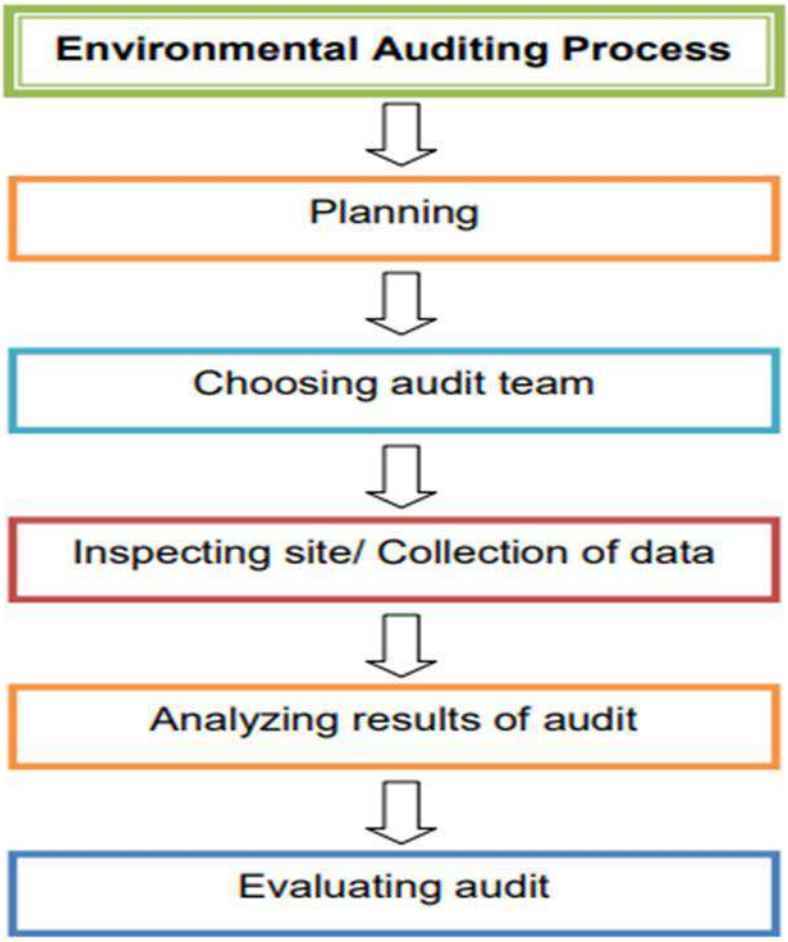
- MBA

DOCTORAL PROGRAMS

- Computer Science
- Electronics and Communication
- Electrical and Electronics
- Mechanical
- MBA
- Physics
- Chemistry
- Mathematics

CHAPTER 3. METHODOLOGY ADOPTED

The audit process was carried out in three phases. At first, all the secondary data required for the study was collected from various sources, like concerned departments as engineering, hostel, garden etc. A broad reference work was carried out to clear the idea of green auditing. Different case studies and methodologies were studied and the following methodology was adopted for present audit. The methodology of present study is based on onsite visits, the personal observations and questionnaires survey tool. Initially, based on data requirement, sets of questionnaires were prepared. The surveyors then visited all the departments of the Institution and the questionnaires were filled. The generated data is subsequently gathered and used for further analysis. From the outcome of the overall study, a final report is prepared.



3.1. SURVEY BY QUESTIONNAIRE:

Baseline data for green audit report preparation was collected by questionnaire survey method. Questionnaires prepared to conduct the green audit in the Institution campus is based on the guidelines, rules, acts and formats prepared by Ministry of Environment, Forest and Climate Change, New Delhi, Central Pollution Control Board and other statutory organizations. Most of the guidelines and formats are based on broad aspects and some of the issues or formats were not applicable for Institution campus. Therefore, using these guidelines and formats, combinations, modifications and restructuring was done and sets of questionnaires were prepared as solid waste, energy, water, hazardous waste, and e-waste. All the questionnaires comprise of group of modules. The first module is related to the general information of the concerned department, which broadly includes name of the department, month and year, total number of students and employees, visitors of the department, average working days and office timings etc. The next module is related to the present consumption of resources like water, energy, or the handling of solid and hazardous waste. Maintaining records of the handling of solid and hazardous waste is much important in green audit. There are possibilities of loss of resources like water, energy due to improper maintenances and assessment of this kind of probability is necessary in green audit. One separate module is based on the questions related to this aspect. Another module is related to maintaining records, like records of disposal of solid waste, records of solid waste recovery etc. For better convenience of the surveyor, some statistics like, basic energy consumption characteristics for electrical equipment etc. was provided with the questionnaires itself.

ONSITE VISIT AND OBSERVATIONS:

The Don Bosco Institute of Technology has vast built-up area comprising of various departments, administrative building, teachers and staff quarters, student hostels, guest house, sports complex and health center. All these

amenities have different kind of infrastructure as per their requirement. All these buildings were visited by the surveyors and the present condition is checked with the help of the questionnaires. Personal observations were made during the onsite visit. All the amenities were clubbed in as per their similarities and differences, which makes the survey and further analysis easier.

DATA ANALYSIS AND FINAL REPORT PREPARATION:

A proper analysis and presentation of data produced from work is a vital element. In case of green audit, the filled questionnaires of the survey from each group, were tabulated as per their modules, in Excel spreadsheets. The tabulated data is then used for further analysis. For better understanding of the results and to avoid complications, averages and percentages of the tables were calculated. Graphical representation of these results was made to give a quick idea of the status. Interpretation of the overall outcomes was made which incorporates all the primary and secondary data, references and interrelations within. Final report preparation was done using this interpretation.

- In order to meet its objectives, this audit combined physical inspection with a review of relevant documentation and interviews with various stakeholders.
- Review of the Documentation
- For the purpose of this audit the Green Policy of the institute was reviewed.
- Interviews
- Interviews were conducted with the Principal's, Registrar and also faculties and students.
- Physical Inspection
- The audit team was in the college to inspect the campus.

3.2. LIST OF STUDENTS AND STAFF INVOLVED IN GREEN AUDITING

Sl No	Name	Designation
1.	Prof. SAVITHA A L	Professor
2.	Prof. SANDHYARANI G M	Professor
3.	Prof. RAGHAVENDRA R	Professor
4.	Prof. RAGHAVENDRA N	Professor
5.	Mr. MALLESH M	Professor

CHAPTER 4.

ECO -FRIENDLY CAMPUS & GREEN PRACTICES IN DON BOSCO INSTITUTE OF TECHNOLOGY

4.1. AREAS OF GREEN AUDITING

4.1.1. ENERGY AUDIT

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

4.1.2. WATER AUDIT

Water audit can be defined as a qualitative and quantitative analysis of water consumption to identify means of reducing, reusing and recycling of water. Water Audit is nothing but an effective measure for minimizing losses, optimizing various uses and thus, enabling considerable conservation of water in irrigation sector, domestic, power and industrial as well. A water audit is a technique or method which makes possible to identify ways of conserving water by determining any inefficiencies in the system of water distribution. The measurement of water losses due to different uses in the system or any utility is essential to implement water conservation measures in such an establishment.

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. Aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.

It is observed that a number of factors like climate, culture, food habits, work and working conditions, level and type of development, and physiology to determine the requirement of water. The community which has a population between 20,000 to 1,00,000 requires 100 to 150 liters per person (capita) per

day. The communities with a population can consume over 1, 00,000 requires 150 to 200 liters person (capita) per day. As per the standards provided by WHO Regional office for South East Asia Schools require 10-15 liters per student if water- flushed toilets, Administration requires (Staff accommodation not included) 50 liters per person per day, Staff accommodation requires 30 liters per person per day and for sanitation purposes it depends on technology.

4.1.3. BIODIVERSITY AUDIT

All plant and animal species - including humans - are linked together in a complex web of life; we depend upon biodiversity for our survival. Biodiversity is the key to healthy ecosystems and ultimately a healthy planet. It keeps the air and water clean, regulates our climate and provides us food, shelter, clothing, medicine and other useful products. Each part within this complex web diminishes a little when one part weakens or disappears. The trees work hard to keep the air we breathe clean and healthy. Their leaves take in much of the poisonous unwanted carbon dioxide in the air, and replace it with the oxygen we need for healthy living. In this process, the plants with the help of sunlight, water, minerals and the green material called Chlorophyll within the leaves change the carbon- dioxide into food for themselves. When doing this they release oxygen into the air which is vital for all life on earth. The roots of trees dig deep into the earth and hold it together so that the rain and wind cannot wash or blow it away. This is very important as the earth has only a very thin layer (seldom more than one foot) of fertile soil covering it.

4.1.4. BIODEGRADABLE AND HAZARDOUS WASTE AUDIT

This indicator addresses biodegradable waste from college and hostel canteen, paper waste to hazardous wastes of laboratories and worn-out electric & electronic goods, and plastic wastes. Hazardous materials represent significant risks to human health and ecological integrity. Hazardous wastes are also leached out through the e-waste generated in the campus. They often persist in the environment leaving a legacy of land and water contamination for

generations. They also accumulate in the tissues of organisms and become concentrated within food chains, leading to cancer, endocrine disruption, birth defects, and other tragedies. The minimization, safe handling, and ultimate elimination of these materials are essential to the long-term health of the planet.

4.2. LAND AREA STATEMENT

The land under the project is designated for educational activities as per Karnataka Government. No additional burden on land has been created which may adversely affect land use pattern in the area. No natural drain is being obstructed. The Institution land does not interfere with any forest, wetland, river, lake, mountain, national park & sanctuary etc.

The total area of campus – 25 acres.

Sl. No.	PARTICULARS	AREA
1	**Total area**	36 acres
2	Built up area	3.7 Acre (14958.7 m2)
3	Roads/parking	2.1 Acre (8357.2 m2)
4	Green belt area	1.8 Acre (7137.53 m2)
5	Vacant area for future development	22.6 Acre (91458.955 m2)
6	Building Configuration [Number of Blocks / Towers / Wings etc., with Numbers of Basements and Upper Floors, canteen, seminar halls, playground, auditorium, hostels, Labs]	5 Blocks 1Basement + 4 Floors
7	Recreational Area	
a	Total Green belt	1.8 Acre

b	Internal Roads	2.1 Acre
c.	Paved area	
d	Others Specify	5.4 Acre (play Area)
e.	Parks and Open space	22.6 Acre
f.	Total	31.9 Acre

4.3. WATER REQUIREMENT:

The total water requirement for the Institution is 250 KLD. Water quality of ground water resources in the area has been studied for assessing the water environment. Borewell is being used in the campus as source of water.

Total requirement of water in KLD	
Fresh	200
Recycled	50
Total	250
Source of water	Bore wells
1.Whether canteen facility provided for day students etc	Yes
2. Waste water generation in KLD	150 KLD
STP capacity	50 KLD
Technology employed for Treatment and mode of disposal of treated sewage	Activated Sludge Process (ASP)
Scheme of disposal of excess treated water if any	Using for Gardening
Any Treatment for lab water	NIL
No. of ponds, wells	01 Pond, 4 wells, 80 toilets.

4.4. WASTEWATER GENERATION

About 150 m3/day of wastewater is being generated.

4.5. WASTEWATER MANAGEMENT

The Institution follows the systematic procedure for proper management and disposal of liquid waste. The treated water is used for the gardening and other purpose. Institution also conducts discussions with students to make them aware about the liquid waste management techniques.

- In order to treat the domestic and other waste waters, the sewage treatment plant (STPs -1 no) has been installed and successfully operated. The STP capacity is 50 KLD to handle the waste waters generated from College building, Hostels, Canteens and recreational areas such as gymnasium etc.
- The treatment scheme comprises of a biological treatment called ASP, wherein the aerobic bacteria stabilizes all the organic matter, neutralizes the microbial population.
- The STP has been performing smoothly and deliver effluents with BOD values below 10 mg/l. The aerobic treatment followed by disinfection results in microbe concentration below 100 units as stipulated in the consent. Likewise all other listed parameters are also complied with. Analysis reports are regularly forwarded to the KSPCB.

The wet waste from the college, hostels and canteen is disposed in a pit for Organic Composting within the premises.

4.6. WATER REUSE PLAN

The entire premises measures nearly 36 acres, out of which only 10% is covered with buildings and the rest is open areas where the treated water is applied for Green belt development.

SUMMARY:

In the light of ample land area availability with minimal building construction, entire treated water is being reused within the campus, although during peak summer months the demand exceeds the supply and vice versa during the rainy season. The reuse of the treated water can be summarized in the following table:

Sl No	ITEM	AREA/Nos	Quantity, KLD
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		TOTAL	**50KLD**

4.6.1. RECYCLE AND REUSE OF TREATED WASTE WATER

In general the STPs are operated at not more than 80% of the designed capacity and at much lower capacity during vacations, lock down etc. The treated waste waters from STP is utilised for the following activities;

- Gardening and maintaining greenery within the campus. (70 %)
- For construction and curing activities within the campus. (20%)
- Secondary flushing in toilets in the hostel buildings. (5%)
- Dust suppression as and when required. (1%)
- Buses and other vehicles washing within the campus. (4%)

4.7. SOLID WASTE MANAGEMENT:

The Quantity of Biodegradable waste generation is about 100kgs/day. The mode of Disposal is as per norms. The wet waste from the college, hostels and canteen is disposed in a pit for Organic Composting within the premises.

The Quantity of E waste generation waste generation at the premises is about 100kgs/year and Disposed to Authorized recyclers as per norms.

4.8. ENERGY MANAGEMENT:

Energy conservation is an important aspect of campus sustainability which is also linked with carbon foot print of the campus. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

REPLACEMENT OF CFL TUBE LIGHTS WITH LED LIGHTS

- During April 2017 – March 2020, a Total of 706 tube lights (48 Watt) were replaced with 606 LED bulbs of 20 Watts capacity, which resulted in Total savings of 105451 units/year.
- The Institute was having 1188 fans, which were replaced by brushless Direct current fans.
- The Institute has Already Implemented Energy Conservation Measures by Replacing Existing Lighting Fixtures and Fans with Efficient systems. Saving of Energy about 22.31 %.

4.9 SOLAR ENERGY:

The capacity of Solar Power Plant Installed is 170KW. The Conservation of Energy from this installation is 48180 Units/ annum.

Energy & power details			
Electricity charges in Rs.	2019	2020	2021
	?	?	?
No. of Units Consumed year wise in Kilo Watts	2019	2020	2021
	563568	590784	342672
No.of Gas cylinders used per month	-		
No.of Diesel Generators	2 (200KVA and 40KVA)		
Quantity of Diesel consumed	2053 LITERS/YR		
Cost of Generator fuel	-		
Total number of Sodium lamps (150W)	05		
Number of TFL (48W)	706		
No. of LED (20W)	1635		
No. of Fans (65W)	1188		
No.of A.C's	300		
No. of Tube lights	8,000		
No. of Electrical instruments	-		
No. of Computers	102		
No. of Photocopier's	-		
No. of TV's	50		

DG sets:

1. 200 kVA

2. 40 kVA

U P S

1. Total UPS Capacity 319 kVA (total 17 Nos)

4.10. AIR ENVIRONMENT

- In the Institute campus during construction in any stage water will be sprinkled on the soil to avoid dust generation.
- The debris and unused construction debris will be removed immediately for recycling, if any, or for designated land fill
- All vehicles for service activities at the Institution will be checked for vehicular emission. The agencies will be asked to keep them within prescribed limits. They will also be asked to maintain them properly.
- As discussed earlier there will be no other point source of Air pollution, which are noise free. Chimneys of suitable height have been provided to control the G.L.C. of PM 2.5, PM10, SO2, & NOx levels. Extensive tree plantations have been resorted to for further improving the air environment in general and minimize noise levels.

4.10.1. AIR EMISSIONS AND NOISE LEVELS

The Institute has installed low noise generators for power backup. No other point source of emissions like boiler, furnace etc. to run on fossil fuels, have been provided. So, the Institution does not generate Air & Noise Pollution.

4.10.2. TRAFFIC DENSITY

The students are not allowed to keep their own vehicles in the hostel. The Institution has its own buses for local students. The layout has been planned to provide adequate space for parking within the campus.

4.10.3. CARBON FOOTPRINT

Burning of fossil fuels (such as petrol, etc.) has an impact on the environment through the emission of greenhouse gases into the atmosphere. The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions.

The staff and the students of the Institute are having the following facilities for Transportation:

a.	Number of persons using cars	55
b	Number of persons uses two wheelers	250
c.	Number of persons using other transportations like bus etc	300
d	Number of visitors per day	50
e.	Number of Students staying in the hostel	400

4.11. ECOLOGY & BIO –DIVERSITY

4.11.1. FLORA

The campus has a rich collection of trees. Most of the plants have important role in the maintenance of biodiversity and are the good carbon assimilators. Herbal garden and other ornamental gardens were maintained in the campus.

Apart from records of Forest department, field surveys were undertaken to study the vegetation and floral components in the campus.

Number of Trees with Species	
Royal Palm tree	
Pink Trumpet Tabebuia Avalanda	
White Tabebuia Avalanda	
Tabebuia	
Badami tree	
Champaka	
Total	300

Figure: Flora at college campus

4.11.2. FAUNA

Prolific wild life is not observed in the Institute campus, as there is no thick forest/ vegetation is noticed in the Institute Campus.

FAUNAL GROUP	SCIENTIFIC NAMES
SPIDERS	Myrmachne orientalis(Family Salticidae);Nephilaplipes (Family-Nephilidae); Heteropoda sp (Family-Sparassidae); Phintella vitatta (FamilySalticidae)
MOTHS & BUTTERFLIES	Antheria assmensis;Bombyx mori;Philosamia ricini; Junonia atlites atlites ; Commander (Moduza procris procris);Ethope himachala ; Melanitis leda leda ; Paltoporia paraka paraka; Ypthima baldus ; Acraea terpsicore ; Elymnias,hypermnestra,undularis;Mycalesisperseusblasius;Tanaecialepidealepidae;Euploea core core
OTHER INSECTS	Scarlet dragonfly; Pantala flavescens **(**wandering glider), grasshoppers, microbes
REPTILES	squirrels, mouse, snake, lizard
BIRDS	Acridotheres tristis (Common myna); Streptopelia orientalis (Oriental Turtle Dove); Athene noctua (little owl); Pycnonotus cafer (Red-vented Bulbul), crows, sparrows, peacock
MAMMALS	Monkeys, Dogs, Cats

4.12. GREEN CAMPUS INITIATIVES

USE OF BATTERY-OPERATED CARTS

- The Management has proposed to procure battery operated carts for the use within the campus to minimize the movement and pollution arising due to fuel driven vehicles with in the campus.

GREEN BELT DEVELOPMENT

- The premises has created plant nursery that is responsible to create and maintain greenery within the campus.
- The large sized Play ground along with other green belt is helpful in creating significant lung space within the campus and thus, improved air quality.
- The STP sludge is used as soil conditioner cum manure for maintaining the entire greenery in the campus. Also the treated sewage imparts Nitrates and Phosphates to the plants and hence a healthy growth.

RAIN WATER HARVESTING

- In order to minimize the abstraction of ground waters, maintain the underground water table and control the hardness of the water supplied in the campus, the rain water potential has also been estimated for its tapping.
- As per the scheme the roof top water shall be collected in the underground tanks/ sumps, whereas the water collected from paved and unpaved areas shall pass through grease cum silt trap and clean water shall be either directly used or shall be used for recharging the existing bore wells within the campus as per drawings.
- Two such Rain water harvesting tanks have been provided. Similar structures shall be replicated at different locations within premises and other institutions.
- A Sump tank of capacity 20000 litres and Ground water recharging well -2 Nos. have been provided for rainwater harvesting and reused for green belt development.
- Storm water from roofs and open spaces is collected and taken through silt

settling tanks followed by sand filters and then into the recharging bore well.

- The storm water that could not be collected is discharged into the SWD systems leading to public drainage system.
- A large portion of rain water is diverted into the existing pond to maintain the levels.

COMBAT AGAINST GLOBAL WARMING

- The green zones shall be fixing CO2 from the atmosphere and releasing O2 in the atmosphere shall help in slowing down the global warming.
- The solar panels producing green energy is yet another contribution to minimise the use of energy that is generated using the fossil fuels.
- The proposed use of battery-operated carts in the campus not only conserves the liquid fuel (emission of greenhouse gases) but also keeps the noise levels at minimum.
- The replacement of conventional lights (CFLs) by the low wattage LED lights resulted in significant power savings and in turn the emission of green house gases.

CHAPTER 5. CONCLUSION AND RECOMMENDATIONS

Don Bosco Institute of Technology has always taken a green agenda for developing a green campus. It has shown remarkable awareness in maintaining an eco-friendly campus. On visiting the Campus, one can experience the aesthetic and elegant buildings, splendid lawns, spacious sports grounds and lush green environment conducive for teaching-learning process.

1. THE INSTITUTIONAL INITIATIVES FOR GREENING THE CAMPUS ARE AS FOLLOWS:

- Restricted entry of automobiles
- Pedestrian Friendly pathways
- Ban on use of Plastic
- Landscaping with trees and plants

2. RESTRICTED ENTRY OF AUTOMOBILES

The college operates a fleet of buses covering each corner of Bengaluru to facilitate the students and staff. The institute encourages the staff and students to use the college transport instead of their own vehicles for safety, security, fuel conservation and to reduce environmental pollution. The college buses are checked for pollution by the authorized agency.

3. PEDESTRIAN FRIENDLY PATHWAYS

Vehicle parking space is provided at the main entrance of the college campus. As the campus is vehicle free with some exceptions, students and staff experience comfort walking through the pedestrian friendly pathways. The internal roads are lined with trees and they are properly maintained by the campus maintenance committee.

4. BAN ON USE OF PLASTIC

Single-use plastic items such as plastic bottles, bags, spoons, straws and cups are banned completely and awareness is created among staff and students through orientation and display boards in the premises. To restrict the use of plastic, measures have been taken to replace plastic tea cups and glasses with

steel glasses in the canteen.

5. ECO-FRIENDLY TRANSPORTATION:

The college operates a fleet of buses covering each corner of Bengaluru to facilitate the students and staff. The institute encourages the staff and students to use the college transport/Public transport instead of their own vehicles for safety, security, fuel conservation and to reduce environmental pollution. The college buses are checked for pollution by the authorized agency.

CONCLUSION AND RECOMMENDATIONS:

Green Audit is the most efficient way to identify the strength and weakness of environmental sustainable practices and to find a way to solve problem. Green Audit is one kind of professional approach towards a responsible way in utilizing economic, financial, social and environmental resources. Green audits can "add value" to the management approaches being taken by the college and is a way of identifying, evaluating and managing environmental risks (known and unknown).

There is scope for further improvement, particularly in relation to waste, energy and water management. The college in recent years considered the environmental impacts of most of its actions and makes a concerted effort to act in an environmentally responsible manner. Even though the college does perform fairly well, the recommendations in this report highlight many ways in which the college can work to improve its actions and become a more sustainable institution.

SUGGESTIONS:

SOME OF THE VERY IMPORTANT SUGGESTIONS ARE: -

- Increase Awareness of Environmentally Sustainable Development- Use every opportunity to raise public, government, industry, foundation, and Institution awareness by openly addressing the urgent need to move toward an environmentally sustainable future.
- Educate for Environmentally Responsible Citizenship- Establish programs to produce expertise in environmental management, sustainable economic development, population, and related fields to ensure that all Institution graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.
- Involve All Stakeholders- Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development. Expand work with community and nongovernmental organizations to assist in finding solutions to environmental problems.
- Collaborate for Interdisciplinary Approaches- Convene Institution faculty and administrators with environmental practitioners to develop interdisciplinary approaches to curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
- Increase reduce, reuse, and recycle education on campus.
- Name all the trees and plants with its common name and scientific name.
- Display boards of fauna diversity to generate enthusiasm for learners.
- Organize earn while learn eco-friendly programs.
- Conduct exhibitions for parents and public on environment and sustainable practices.
- Arrange training programs on environmental management system and nature

conservation.

- Ensure participation of students and teachers in local environmental issues.

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