GREEN & ENVIRONMENT AUDIT REPORT: 2022-23

Prepared for

M/s. Dr.Babasaheb Ambedkar Technological University

Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India). 402103

Conducted & Prepared By

GREEN CIRCLE INC.

Integrated HSEQR Consulting Engineers, Scientists & Trainers
(MoEF & CC Recognized Environmental Research Laboratory)
An ISO: 9001, 17025/NABL, 14001 & 45001 Certified Organization

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Client : - M/s. Dr. Babasaheb Ambedkar Technological University, Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India). 402103

Project / Document Tittle :- Green & Environment Audit Report

Project / Document Number :- GCI/V/LAB/G075/22-DB/March-23/DB-00/0767

IHS Consultant : - Green Circle, Inc.

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21.03.2023	00	Final Report	Signature Dilip Bhosale	Signature Shital Parmar	Signature Pradeep Joshi	Signature Nachiket Joshi	Signature Sachin Pore
18.03.2023	00	Draft Report	Dilip Bhosale	Shital Parmar	Pradeep Joshi	Nachiket Joshi	Sachin Pore
Date	**Rev.**	**Remarks/ Revision Summary**	**Prepared By**	**Reviewed By**	**Approved By**	**Released By**	**Approved By**
			Green Circle Inc.				**Client**
REVISION RECORDS							

Preface

Consciousness at National Level is increasing day by day in the Educational & industrial sector with the main focus on **Green & Environment** and **Sustainable Development.** A successful Environment Management Policy requires a constant and round the clock effort to analyze and monitor the various department & laboratories, playground, waste water management, Solid waste management, electrical details within the university premises so that it does not pollute the air, water, land, soil, or environment further and at the same time transmit this information to the inspecting authority**.** Such an exercise to generate necessary information about analysis of various emissions including air, water, noise, solid waste etc, treatment methods, abatement techniques, up gradations done to improve the system from time to time and the compilation of annual estimates is termed as **Green & Environmental Audit**.

Green & Environmental audit on the other hand refers to verification and assessment of environmental measures in an organization. In a broader sense Green & Environmental Audit is defined as a managerial tool, which includes the activity of systematic periodic and documented objective evaluation of how the organization, management and Equipments perform their environmental activities, so that it facilitates the management control our environment practice and assessing compliance with CPCB policies which would include meeting regulatory requirements.

Keeping this in view a sincere attempt is made by us to carry out the Green & Environmental Audit of ***M/s. Dr.Babasaheb Ambedkar Technological University, Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India). 402103*** a fair and unbiased report is hereby presented in the form of this Environmental Audit report. Any error or lacuna in the same may be due to oversight and is unintentional. All efforts shall be made to cover up the short-comings and remove the errors in subsequent reports.

Thus the information collected by the Green & Environmental Audit team of Green Circle Inc. Regarding the industry and analysis of its various samples has proved to be useful in judging the adequacy and efficacy of the Environmental Control Measures and we hope this report shall enable our client to fulfill their commitment for continuous improvement of Environment.

For: Green Circle, Inc.

Authorized Signatory

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Abbreviation

MPCB	Maharashtra Pollution Control Board
CPCB	Central Pollution Control Board
CC&A	Consolidated consent & Authorization
CTE	Consent to Establish
EHS	Environment, Health & Safety
EMS	Environment Management System
GCI	Green Circle Inc.
PM_{10}	Particulate matter of 10 micron size
$PM_{2.5}$	Particulate matter of 2.5 micron size
SO_2	Sulphur Dioxide
NO_x	Oxides of Nitrogen
COD	Chemical oxygen demand
BOD	Biochemical oxygen demand
IS	Indian Standard
ISO	International Organization for Standardization
ETP	Effluent Treatment Plant
STP	Sewage Treatment Plant
PLI	Public Liability Insurance
MT	Metric ton
KLD	Kilo Liters per day
CO	Carbon Monoxide
HC	Hydrocarbon
APHA	American Public Health association
BIS	Bureau of Standards

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Credits

We, M/s. Green Circle, Inc. Vadodara, Gujarat sincerely thank ***M/s. Dr.Babasaheb Ambedkar Technological University, Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India). 402103*** for appointing us to conduct **Green & Environment Audit** of their University Facility**.**

We express our sincere thanks to management & employees of ***M/s. Dr.Babasaheb Ambedkar Technological University, Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India). 402103*** for their courtesy extended to our team, co-operation & unstinted support during the Green & Environment Audit on **Feb-March, 2023.**

To conduct **Green & Environment Audit,** The Audit team of **M/s. Green Circle, Inc. Vadodara, Gujarat** comprises:

- Mr. Pradeep Joshi – CEO & Group President
- Ms. Shital Parmar, Dy. Manager-Lab
- Mr. Dixshant Shashtri – Assistant Manager – EPL/R&D
- Mr. Dilip Bhosale - Assistant Manager - WtR & Sustainability
- Mr. Suraj Khatode, Sr.Exe - Environment

The GCI team was assisted & guided by a Team of officials from ***M/s. Dr.Babasaheb Ambedkar Technological University, Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India). 402103*** during Safety Audit comprising of:

- Dr. Sachin M. Pore, Professor Dept. of Civil Engineering & Dean (Research & Development)
- Ms. Aakanksha A. Darge, Assistant Professor, Dept. of Civil Engineering
- Mr. Ganesh A. Suryawanshi, Assistant Professor, Dept. of Civil Engineering

M/s. Green Circle, Inc. Survey/Monitoring team conducted the **Green & Environment Audit** as per the standards and guidelines with standard procedures & methodology including close interactions and interviews of the professor, students as well as other concerned personnel

GREEN AUDIT

Certificate

This is to certify that the M/s. Green Circle, Inc. Vadodara, Gujarat has conducted detailed "***Green Audit***" of" M/s. Dr. Babasaheb Ambedkar Technological University, Lonere, Tal-Mangaon, Dist – Raigad. Maharashtra (India). 402103 " during the academic year 2022-2023 to assess the green initiatives planning and efforts implemented in the University campus like Green Campus Management, Carbon Footprint, plantations, waste management and rainwater harvesting, conservation of energy. In an opinion and to the best of our information and according to the information given to us. Said green audit gives a true and fair view in conformity with Green & Environmental auditing principles accepted in India.

Place: Lonere

Date: 21th March 2023

For: Green Circle, Inc.

Authorized Signatory

ENVIRONMENT AUDIT

Certificate

This is to certify that the M/s. Green Circle, Inc. Vadodara, Gujarat has conducted detailed "***Environment Audit***" of" M/s. Dr. Babasaheb Ambedkar Technological University, Lonere, Tal-Mangaon, Dist – Raigad. Maharashtra (India). 402103 " during the academic year 2022-2023 to assess the impact of Environment initiatives for maintenance of eco-friendly campus. The environment audit was conducted in accordance with the applicable standards prescribed by Central Pollution Control Board. New Delhi and Ministry of Environment. Forest and Climate Change. New Delhi. The audit involves water, wastewater. Energy, air, green inventory, solid waste etc. and gives an Environmental Management Plan". Which the university can follow to minimize impact on the institutional working framework. In an opinion and to the best of our information and according to the information given to us. Said Environment audit gives a true and fair view in conformity with environmental auditing principles accepted in India.

Place: Lonere

Date: 21th March 2023

For: Green Circle, Inc.

Authorized Signatory

1. Executive Summary

M/s. Dr.Babasaheb Ambedkar Technological University, Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India). 402103 *has appointed* **M/s. Green Circle, Inc. Vadodara, Gujarat** to conduct **Green & Environment Audit** of their University Facility**.**

Green Circle, Inc express sincere thanks to management & employees of ***M/s. Dr.Babasaheb Ambedkar Technological University, Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India). 402103*** for their courtesy extended to **Green Circle, Inc** team, co-operation & unstinted support during the **Green & Environment Audit** on **2022-2023.**

The **Green Circle, Inc** team was assisted & guided by a team of officials from ***M/s. Dr.Babasaheb Ambedkar Technological University, Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India). 402103***

Site visit was conducted in March-23 by the members of audit team and areas like education department are Basic Sciences & Humanities, Chemical Engineering, Civil Engineering, Computer Engineering, Department of Electrical Engineering Electronics & telecommunications Engineering, Information Technology, Mechanical Engineering, Petrochemical Engineering, waste storage area, ETP Plant, STP Plant, University Area and post molding section were explored for the Green & Environment audit. During the green & environment audit samples for environment monitoring were taken for ambient air, waste water and noise monitoring.

Observations were taken during the site visit and recorded in the audit report, and it was found that, The University in recent years considers the environmental impacts of most of its actions and makes a concerted effort to act in an environmentally responsible manner. Even though the University does perform fairly well, the recommendations in this report highlight many ways in which the University can work to improve its actions and become a more sustainable institution.

- ✓ All departments generate paper waste. Especially, academic building is using more one paper for printing and writing is good practices.
- ✓ Food waste generated in campus is mostly from is collected from dining areas. The food waste is diverted to nearby farm.
- ✓ Rainwater is collected from rooftop to recharge the ground water level table

2. Organizational Profile

Dr. Babasaheb Ambedkar Technological University was established by Government of Maharashtra vide Dr. Babasaheb Ambedkar Technological University Act. No. XXII of 1989 as a Unitary University. Later, the Government of Maharashtra converted the University to the Affiliating Technological University in the year 2016 vide Maharashtra Act No. XXIX of 2014 with the jurisdiction of the University as the entire state of Maharashtra.

- Presently, 240+ institutes are affiliated to the University and the total student strength is more than one lakh.
- The sprawling 468 acres campus of this University provides as a sanctum seat of learning across the state.
- The University attracts meritorious students from the entire state and moulds them into employable engineers and competent technocrats.
- This University provides well equipped laboratories with testing and analysis facility which can be extended for the benefit of the industries. In addition, the University offers facilities like conference hall, auditorium, playground, workshop, computing facilities. The University has spacious and conditioned hostels with all basic amenities.

- The University is blessed with highly qualified faculty who are committed to impart best kind of knowledge through effective teaching learning process. The faculty and staff of the University believe that achieving excellence is the challenging task and they continuously strive for it.
- University also provides conducive environment and opportunities to the students for research and innovation which leads to create entrepreneurs The University is empowered to affiliate institutions that offer UG, PG and Ph.D. level programs in the disciplines of Engineering, Pharmacy, Architecture and Hotel Management and Catering Technology.

Mission

The University is committed to provide quality technical education, research and development services to meet the needs of industry, business, service sector and society, at large.

Vision

The University is committed to become a leading 'Center of Excellence' in the field of Engineering, Technology and Science as a seat of learning with a national character and international outlook.

Acts, Rules, Ordinances and Statutes

Acts of the University:	Maharashtra Act Number 22 of 1989	Maharashtra Act Number 29 of 2014
Rules and Regulations:	First Rules And Regulations	
Ordinances:	First Ordinances July 2016	
Statutes:	First Statutes	
UGC act	UGC Act 1959	

3. Introduction

Dr. Babasaheb Ambedkar Technological University, Lonere, Tal- Mangaon, Dist – Raigad. Maharashtra (India) basic education department are Basic Sciences & Humanities, Chemical Engineering, Civil Engineering, Computer Engineering, Department of Electrical Engineering Electronics & telecommunications Engineering, Information Technology, Mechanical Engineering, Petrochemical Engineering.

University Longitude & Latitude: 18˚10'11" N and 73˚20'21"E, Nearest Railway Station: Veer Railway Station (5.1Km), Mangaon Railway Station (11Km), Nearest Airport : Chhatrapati Shivaji International Airport (158.4Km)

About University

Dr. Babasaheb Ambedkar Technological University, with its headquarters situated at Lonere, is now a statutory State Technical University established by Government of Maharashtra through special Dr. Babasaheb Ambedkar Technological University Act. The university has been accorded the status of an „affiliating" university of the entire State of Maharashtra from March 2, 2016, by the Maharashtra Act No. XXIX of 2014. Dr. Babasaheb Ambedkar Technological University is one and only one of its kinds in the State. The University is located at Lonere, the place in the ranges of Western Ghat, at the foot of Raigad fort. It is autonomous in nature and Unitary in its character. It is established in the year 1989 by the Government of Maharashtra. Although relatively young, the University is making its mark in the field of research and technological services through its dedicated faculty and disciplined students.
The University offered 20 B Tech programmes such as
Automobile Engineering
Second Year B. Tech program in MINING ENGINEERING

- Civil Engineering
- Chemical Engineering Second Year (Revised)
- Computer Engineering
- Information Technology
- Electronics Engineering
- Mechanical Engineering

- Mechanical Engineering (Sandwich)
- Instrumentation Engineering
- Production Engineering
- Electrical Engineering
- Chemical Engineering
- Electronics & Telecommunication Engineering
- B. Tech. in Electronics & Communication Engineering (Sandwich)
- Petrochemical Engineering Second Year
- Electrical & Instrumentation Engineering (Second Year)
- Instrumentation Engineering (Second Year)
- Mining Engineering
- Biomedical Engineering

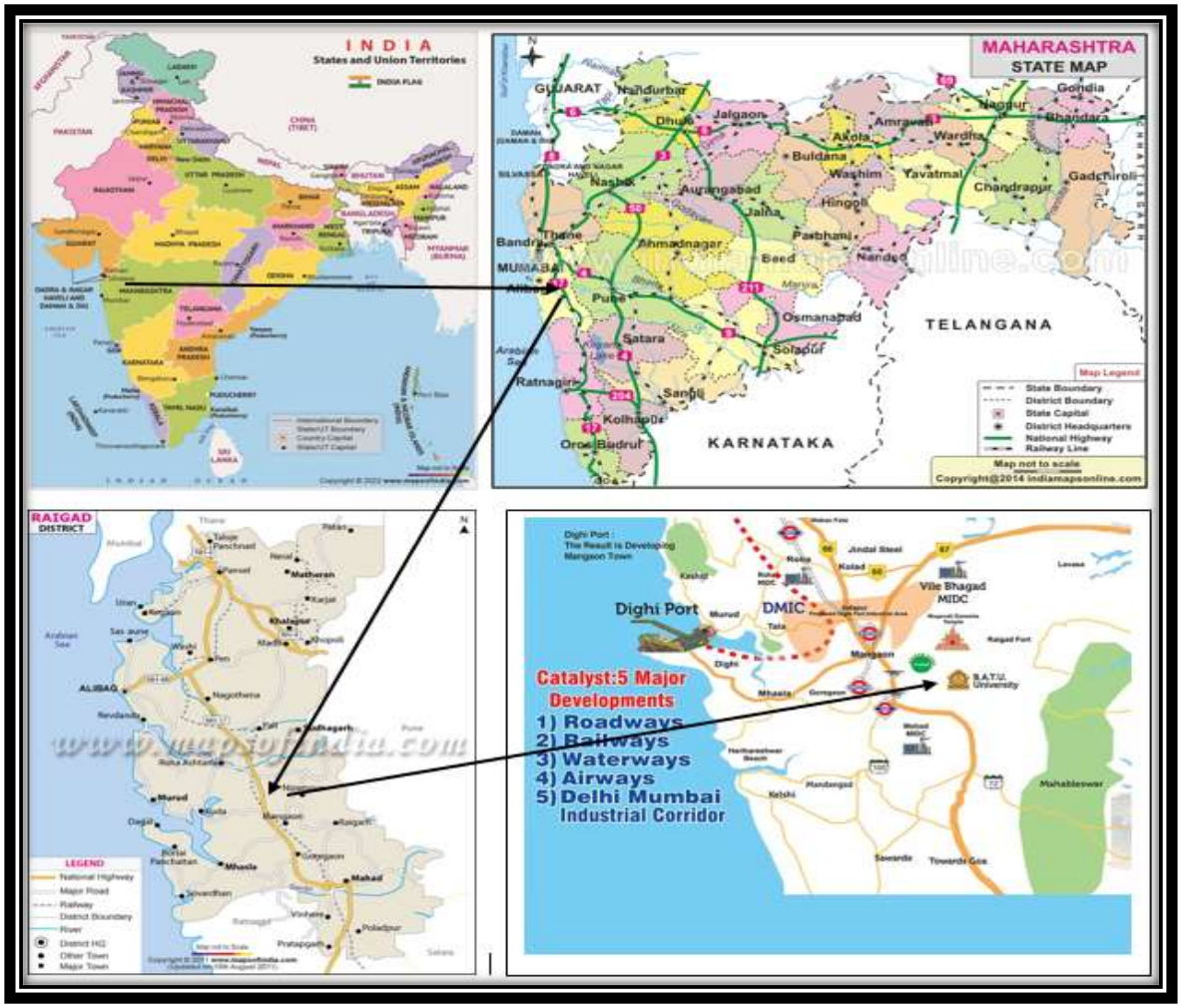
The University introduced choice-based credit system from the academic year 2010-11. Academic systems such as credit-based continuous assessment system, non-negotiable academic calendar, transparency in the evaluation, etc. have been put in place.

A two-fold increase in enrolment of M.Tech. programmes have been achieved due to the grant of assistantship to non-GATE M.Tech. Students and 29 PhDs were given research assistantship in TEQIP-II which concluded in March 2017

Several research labs, library and learning resources have been augmented and strengthened with TEQIP-II support. 180 institutes are affiliated to DBATU for different streams.

Top view of University

3.1 University Location



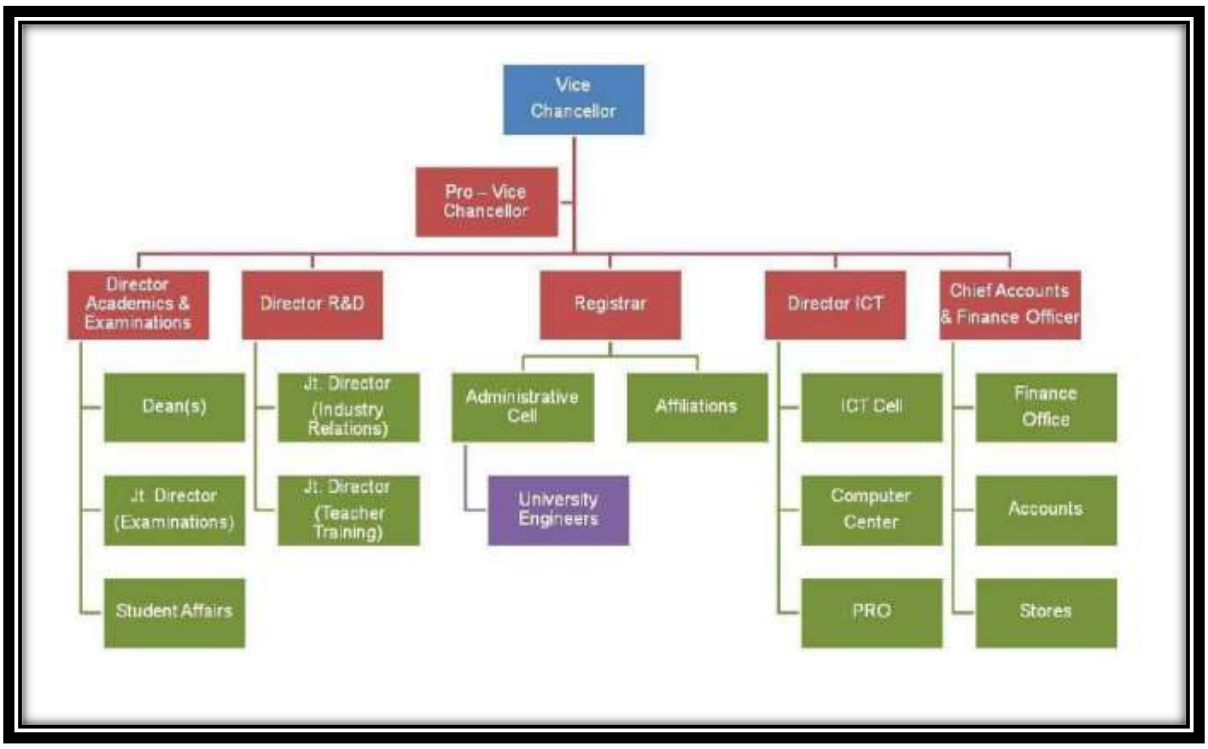
3.2 Need for green & Environment audit

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. In this context, it becomes imperative to adopt the system of the Green Campus for the Institutes which will lead to sustainable development. Besides, it also reduces a sizable amount of atmospheric carbon dioxide from the environment. Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that accredits the institution according to the scores assigned at the time of accreditation. NAAC has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

The modernization and industrialization are the two important outputs of twentieth century which have made human life more luxurious and comfortable. Simultaneously, they are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources and finally making our mother Earth ugly and inhospitable. Today, people are getting more familiar to the global issues like global warming, greenhouse effect, ozone depletion and climate change etc. Now, it is considered as a final call by mother Earth to walk on the path of sustainable development. The time has come to wake up, unite and combat together for sustainable environment. Green Audit is the most efficient ecological tool to solve environmental problems. It is a process of regular identification, quantification, documenting, reporting and monitoring of environmentally important components in a specified area. Through this process the regular environmental activities are monitored within and outside of the concerned sites which have direct and indirect impact on surroundings. Green audit can be one of the initiative for such institutes to account their energy, water resource use as well as wastewater, solid waste, E- 10 waste, hazardous waste generation.

Green Audit process can play an important role in promotion of environmental awareness and sensitization about resource use. It can create consciousness towards ecological values and ethics. Through green audit one can get direction about how to improve the condition of environment. The major objective of performing Green Audit is controlling the pollution. It also helps in improving the safety and to making sure the prevention and reduction of the waste. It also provides performance reviews of working facilities and its possible impact on the surroundings. Audits enable the management of an organization to see exactly what is happening within the organization and to check the operation (or otherwise) of systems and procedures. Environmental auditing can help to reveal the likely weaknesses of an organization's strategy, therefore reducing the risk of unexpected events. A properly prepared and conducted environmental audit will bring real benefits to an organization committed to act on the results.

3.3 Organization Chart



3.4 Representative photos

4. Green Audit and Environmental Audit

Green audit:

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 University to determine how and where they are using the most energy or water or resources; the University 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 a better understanding of Green impact on campus. Thus it is imperative that the University 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.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric carbon-di-oxide from the environment. Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Moreover, it is a part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures. 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.

Environmental Audit

An environmental audit is a type of evaluation intended to identify environmental compliance and management system implementation gaps, along with related corrective actions. In this way they perform an analogous (similar) function to financial audits. There are generally two different types of environmental audits: compliance audits and management systems audits. ISO 14001 is a voluntary international standard for environmental management systems ("EMS"). ISO 14001:2004 provides the requirements for an EMS and ISO 14004 gives general EMS guidelines. The Supreme Audit Institution (SAI) in India is headed by the Comptroller and Auditor General (CAG) of India who is a constitutional authority. The audit conducted by CAG is broadly classified into Financial, Compliance and Performance Audit. Environmental audit by SAI India is conducted within the broad framework of compliance and performance audit. Environmental auditing is a systematic, documented, periodic and objective process in assessing an organization's activities and services in relation to:

- Assessing compliance with relevant statutory and internal requirements
- Facilitating management control of environmental practices
- Promoting good environmental management
- Maintaining credibility with the public
- Raising staff awareness and enforcing commitment to departmental environmental policy
- Exploring improvement opportunities
- Establishing the performance baseline for developing an Environmental Management System (EMS)

5. Objectives of Green Audit

Objectives of the audit

- Understanding the current practices of sustainability with regard to the use of water and energy, generation of wastes, transportation, purchase of goods, etc.
- Establishing a baseline of existing environmental conditions with focus on natural and physical environment.
- Creating awareness among students and staff concerning real issues of environment and its sustainability.
- To create a report that document baseline data of good practices and provide strategies and action plans towards improving environmental quality for future.

6. Goals of Green & Environment Audit

GOALS OF GREEN & ENVIRONMENT AUDIT University has conducted a green audit with specific goals as:

- Identification and documentation of green practices followed by university.
- Identify strength and weakness in green practices.
- Analyze and suggest solution for problems identified.
- Assess facility of different types of waste management.
- Increase environmental awareness throughout campus
- Identify and assess environmental risk.
- Motivates staff for optimized sustainable use of available resources.
- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issue before they become problem
- Assess the nature and extent of the risk of harm to human health or the environment.
- Recommend measures to manage the risk of harm to human health or the environment.
- Make recommendations to manage the contaminated land, waste, pollution or activity

7. Target Areas of Green Audit

- **Energy Conservation and Management:** This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles.
- **Water Quality and Conservation:** This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures.
- **Biodiversity Conservation:** All plant and animal species - including microorganisms - are a part of biodiversity. All types of gardens, lawns and trees are considered in this aspect.
- **Waste Management:** This indicator addresses all types of waste from University and associated amenities. The minimization, safe handling, and ultimate elimination of these materials are essential to the long-term health of the planet.
- **Carbon Footprint:** This aspect is for quantifying the carbon emissions from all the parts of the institution and quantifying how much of it is sequestrated with the help of landscape

8. Methodology

8.1 Data Collection

In preliminary data collection phase, exhaustive data collection is performed using different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons, etc. Focus groups, if practiced, can also be a vital part of data collection stage to acquire qualitative information. The discussion should be focused on identifying the attitudes and awareness towards environmental issues at the institutional and local level. Questionnaire (Annexure) prepared to conduct the green audit in the campus is in accordance with the guidelines, rules, acts and formats prepared by Ministry of Environment and Forest, New Delhi, Central Pollution Control Board and other statutory organizations. The data covers the target areas to summarize the present status of environment management in the campus.

8.2 Survey by Questionnaire

Baseline data for green audit report preparation was collected by questionnaire survey method. Most of the guidelines and formats are based on broad aspects. Therefore, using these guidelines and formats, combinations, modifications and restructuring was done and sets of questionnaires were prepared as solid waste, energy, water, biodiversity, carbon footprint. All the questionnaires comprises 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. One separate module is based on the questions related to the losses. Another module is related to maintaining records, like records of disposal of solid waste, records of solid waste recovery etc.

8.3 Data Analysis

The data required for the analysis is taken from the data collection, it includes: calculation of energy consumption, analysis of latest electricity bill of the campus, measuring water consumption, carbon foot printing, etc. The data from questionnaire and survey forms is tabulated for the convenience of data availability; Recommendations and Environmental Management Plan is built according to the analysis done in this step.

8.4 Recommendations and Reporting

Based on the data analysis step, some recommendations in the target areas are made. Specific measures are suggested to reduce water and energy consumption. Proper treatments of waste are suggested with respect to waste collection, waste disposal and recycling. Recommendations to reduce the use of fossil fuels are made for the betterment of community health. Proper disposal of hazardous waste is suggested to prevent mishaps. Management also takes into account the suggestions related to reducing their carbon footprint

9. Detailed Analysis

The data required for the analysis is taken from the data collection, it includes: calculation of energy consumption, analysis of latest electricity bill of the campus, measuring water consumption, carbon foot printing, etc. The data from questionnaire and survey forms is tabulated for the convenience of data availability; Recommendations and Environmental Management Plan is built according to the analysis done in this step.

9.1 Waste Management

Solid Waste Management; Kitchen & Gurdon Waste collected & store in storage area.

Measurement of Kitchen waste collected

Solid waste collected at university

The term solid waste management mainly refers to the complete process of collecting, treating and disposing of solid wastes.

Waste Water Treatment Plant

Waste water generated from university shall be treated in effluent treatment plant. Waste water treat as per CPCB norm.

Waste water treatment plant

9.2 Energy Conservation and Management

Lighting System

Lighting is provided in commercial buildings, indoor and outdoor for providing comfortable working environment. The primary objective is to provide the required lighting effect for the lowest installed load i.e. highest lighting at lowest power consumption. There are number of buildings in DBATU Campus. The details of inventories are shown in the table.

Table: Main building lighting inventory

Sr. No.	Name	PC	CFL 11 W	CFL 18 W	LED 45 W	Tube Light	Fan	Wall fan
1	Registrar Office	3		10		12	7	
2	Establishment and account section	18		0		40	20	
3	VC office	12		10		60	10	
4	Conference Hall			20		12	6	
5	Edusat and Analytical	10		10		36	18	
6	Student section	6				18	8	
7	CNC Lab	4				12	6	
8	Computer center	60		40		20	4	
9	T&P	4		10				4
10	Class room complex					220	180	
11	Petrochemical Department	5				8	6	
12	Library	32				100	80	
13	Canteen							
14	Exam Department	10				40	18	
15	Mechanical	35				16	12	
16	Chemical and Petrochemical	10		24		20		
17	Electrical	30				40	30	
18	Electronic	20				24	18	
19	Physics	6				10	8	
20	Passage		500			120		
21	Computer Department	70				50	50	
22	IT Department	70				50	50	
23	Street Light				150			
Total		**405**	**500**	**124**	**150**	**908**	**531**	**4**

Table: Hostel inventory

Sr. No.	Name	PC	Tube Light	Fan	Exhaust fan
1	Sahyagiri	2	170	150	6
2	Gagangiri	2	210	190	6
3	Dhavalgiri	2	170	150	6
4	Malaygiri	2	170	150	6
5	Alaknanda	2	110	90	6
Total		**10**	**830**	**730**	**30**

Table: Guest House inventory

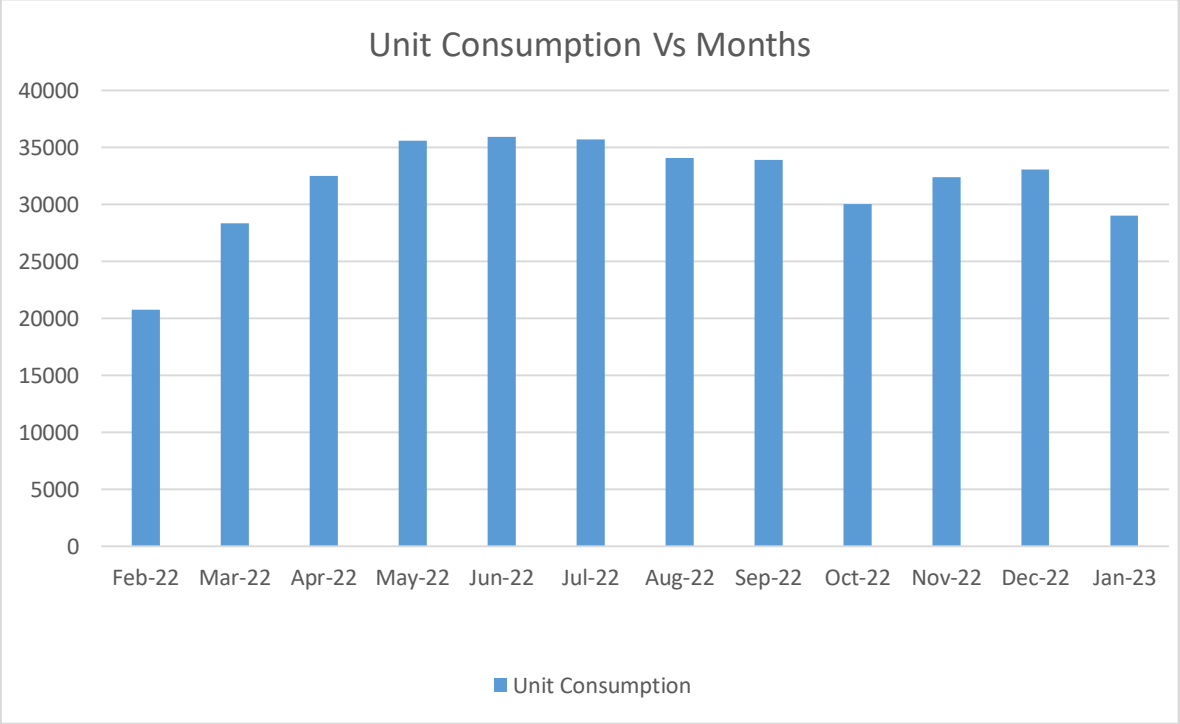
Sr. No.	Name	PC	Tube Light	Fan
1	Anandvan Guest House	2	100	80
2	Raigad Darshan	2	28	14
Total		**4**	**128**	**94**

Table: Quarters inventory

Sr. No.	Name	CFL 18 W	Tube Light	Fan	Exhaust fan
1	Indrayani	24	48	48	12
2	Savitri	24	48	48	12
3	Godavari	24	48	48	12
4	Vainganga	16	48	40	8
5	Panchganga	16	48	40	8
6	Krishna	16	48	40	8
7	Kaveri	16	48	40	8
8	Gomati	15	36	36	6
9	Saraswati	15	36	36	6
10	Sabarmati	15	36	36	6
11	Chandrabhaga	12	24	24	
Total		**193**	**468**	**436**	**86**

Annual Energy Consumption

Month & Year	Units	Bill Amount
Jan 2023	29029	301640
Dec 2022	33084	337467
Nov 2022	32402	331706
Oct 2022	30010	318351
Sep 2022	33926	349959
Aug 2022	34101	347781
July 2022	35697	358855
June 2022	35959	390439
May 2022	35618	386185
April 2022	32510	343062
March 2022	28346	287731
Feb 2022	20751	216422
Total	**381433**	**3969598**
Average	**31786**	**330800**
Solar Power Generation	KWH	
Alternate Power Generation	KWH	
Total Power Consumption	KWH	



Graphical Representation of Annual Energy Consumption

Renewable energy source – Solar Street light at University campus

Solar Street lights in the Campus at different locations

LED Street Lights

9.3 Water Quality and Conservation

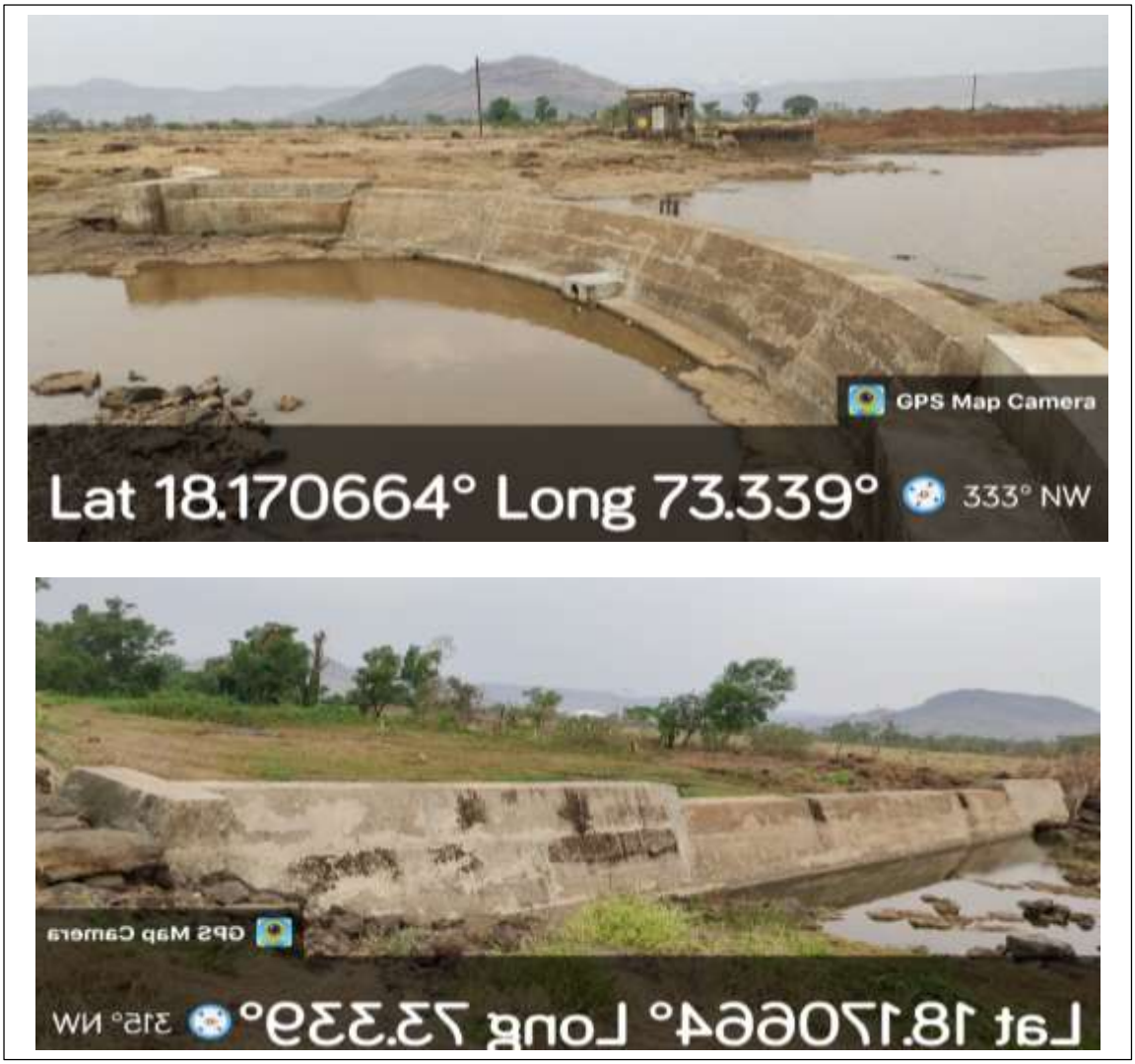
Water treatment facility installed at roof of University building

Water treatment facility installed at roof of University building

Water Conservation au University Campus

Water management at university

Water Conservation at university campus



Water Conservation by constructions Arch dam across a river near to hostels

9.4 Biodiversity Conservation

Gardening at University campus

Open Well near Statue of Dr. Babasaheb Ambedkar & Korean Lawn around the statue of Dr. Babasaheb Ambedkar

Garden in front of Guest House ‘Anandvan’.

9.5 Carbon Footprint

A carbon footprint (CF) is the total amount of greenhouse gases (including carbon dioxide and methane) that are generated by our actions.

A carbon footprint is an estimate of the climate change impact of activity – such as making a product, living a lifestyle or running a company. There are many existing and evolving standards for calculating carbon footprints but in truth no footprint is precise. For more complicated activities these uncertainties are greatly multiplied.

a. Carbon Emissions:

List of carbon emissions

Classification/Scope	Sources	Description
Scope 1 (Direct)	Equipments usage	DG set and LPG
Scope 2 (Indirect)	Electricity Use	BATU uses electricity to heat, cool, light, and run appliances at its facilities.
Scope 3 (Indirect)	Employee commuting And raw materials transportation	Employees commute from their residences to the University and material transportations
	Wastewater treatment	BATU generate total 50-70 m3 of wastewater

b. Carbon Emissions Management:

Global warming presents many environmental dangers, but as individuals, we pay the costs of climate change out of our own pockets. When we lower our individual carbon footprints – by reducing our consumption, using clean energy, or offsetting our emissions, we're investing in our long-term financial security. For reducing Carbon Footprint of the University, all the staff as well as students observe 'No Vehicle Day' on every Saturday.

c. Mitigatory measures:

- Reduce water consumption of Science University as it contributes majorly to the total carbon emission.
- Make sure most teachers and students opt for public transport instead of using personal vehicle.
- Use as much renewable sources of energy as you can.
- Increase the solar energy consumption of overall University.
- Reduce the waste generated by biology, chemistry and other departments.

9.6 Environment Monitoring

DG Set

Exhaust gas from DG set regularly monitoring & maintain within standard limit. Generally parameter analyses PM10, **$PM_{2.5}$, SO_2, and NOx**

DG Set used for Emergency power supply

10. Innovative Strides

Artificial Shelters provided for the birds near to Guest house of the University.

Artificial Shelters provided for the birds near to Guest house of the University.

11. Facilities by campus

12. Recommendations

Water Management:

- ✓ Add aerators/regulators to taps to save water it work by simply mixing air into the flow and this reduces the amount of water passing through the tap.
- ✓ Pipes, overhead tanks and plumbing system should be maintained properly to reduce leakages and wastages of water
- ✓ Install water meters to measure water consumption regularly
- ✓ Install New Set up University's own water recycling unit/STP where the recycled water can be used for gardening in University and hostels
- ✓ Perform water, energy and waste management audits frequently
- ✓ Non-teaching staff or peons in the concerned section should take responsibility of monitoring the overflow of water tanks
- ✓ Keep record of the waste generation by the University

Energy

- ✓ University has many areas where lighting is not required at all times. Installing sensor based lighting in such areas can generate massive rewards. This is one of the easiest ways to save energy at University.
- ✓ Replacing old computers and instruments with ones having energy efficiency certifications is the easiest way to conserve energy at university.
- ✓ A huge amount of energy is wasted because no one really cares about switching off the fans and lights when not required. Hence, planning workshops on energy conservation to educate students, faculty and staff can generate huge results.
- ✓ Establish a purchase policy that is energy saving and eco-friendly
- ✓ Replace all incandescent and CFL lamps with LED lights
- ✓ The University needs to arrange the energy conservation program for the purpose of awareness of fuel energy conservation and motivation of students for use of non-conventional energy devices.
- ✓ University needs to use alternative sources instead of use of LPG (Non-conventional sources) for laboratory and other sources.

Solid Waste:

- ✓ Install a Biogas plant in the campus fir organic waste (Kitchen & Gurdon Waste). It can be used as an agricultural fertilizer. Biogas can be used as the fuel in the system of producing biogas from agricultural wastes and co-generating heat and electricity in a combined heat and power (CHP) plant. Organic waste converter also useful to produce organic manure.

- ✓ Avoid plastic/thermocol plates and cups in the University level or department level functions
- ✓ The University should ban use of plastic and campus should be declared "Plastic free campus"
- ✓ E – Waste sent to authorized MPCB recycler.
- ✓ In all functions, workshops and conferences, the plastic mineral water bottles, tea cups, straws, bouquets and gifts with plastic covering, decorations and unwanted plastic should be strictly avoided.
- ✓ To cut down the waste and carbon footprint, the university administration and various departments follows paperless methods of communication by using emails.
- ✓ The solid waste should be reused or recycled at maximum possible places.

Biodiversity

- ✓ Grow up vegetable garden and fruit garden to attract more fauna.
- ✓ Develop a butterfly garden that arouses appreciation towards flora and fauna diversity.
- ✓ Name all the trees and plants with its common name and scientific name and their uses.
- ✓ Display boards of fauna diversity to generate enthusiasm for learner.

General

- ✓ Establish an environmental committee to look after the environmental aspects of the campus.
- ✓ Adopt green building rating system like IGBC GRIHA OR LEED which will further help in maintaining the campus for different environmental aspects.
- ✓ Layout 'Green Chemistry' that reduces or eliminates the use or generation of hazardous substances in the design, manufacture and application of chemical products.
- ✓ Organize earn while learn eco-friendly programmers.
- ✓ Conduct exhibitions for parents and public on environment and sustainable practices.
- ✓ Organize earn while learn eco-friendly programmers.
- ✓ Adopt an environment policy for the University.
- ✓ Ensure participation of students and teachers in local environmental issues.
- ✓ Detail Study give accurate data of university for details implementation in Environment.

13. Conclusions

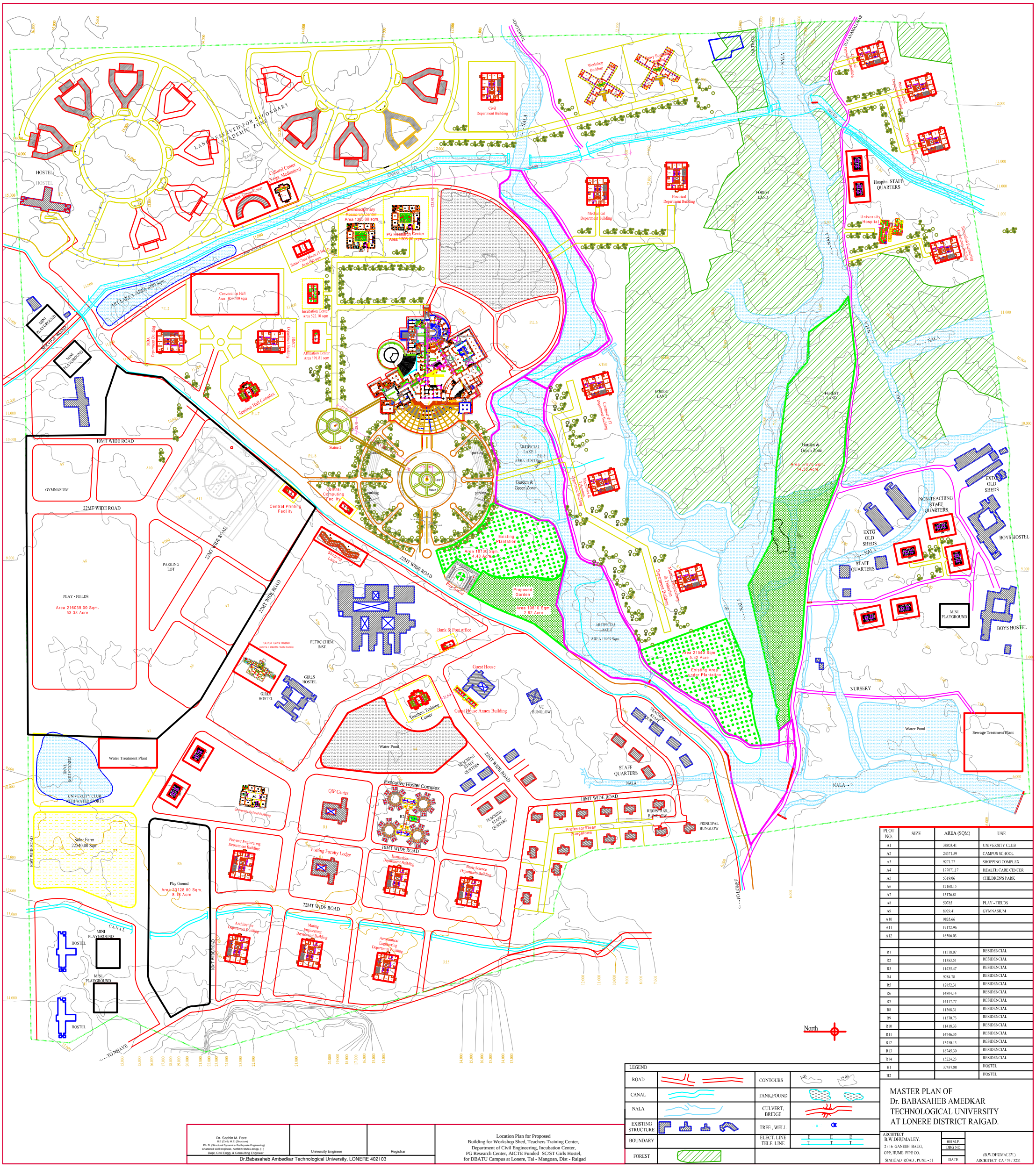
Green & Environment Audit is the most efficient way to identify the strength and weakness of environmental sustainable practices and to find a way to solve problems. Green 7 environment Audit is one kind of a professional approach towards a responsible way in utilizing economic, financial, social and environmental resources. Green audit can "add value" to the management approaches being taken by the University 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 University in recent years considers the environmental impacts of most of its actions and makes a concerted effort to act in an environmentally responsible manner. Even though the University does perform fairly well, the recommendations in this report highlight many ways in which the University can work to improve its actions and become a more sustainable institution.

- ✓ All departments generate paper waste. Especially, academic building is using more one paper for printing and writing is good practices.
- ✓ Food waste generated in campus is mostly from is collected from dining areas. The food waste is diverted to nearby farm.
- ✓ Rainwater is collected from rooftop to recharge the ground water level table

14. References

- ✓ NEP (2006). National Environment Policy, 2006. Ministry of Environment, Forest and Climate Change, Govt.
- ✓ Patil S., Langi, B., Gurav, M. 2019. Green Audit in Academic Institutes. International Journal of Multidisciplinary Educational Research 8 (6): 97-107
- ✓ THE ENVIRONMENT (PROTECTION) ACT, 1986, 19th November, 1986, vide notification No. G.S.R. 1198(E), dated 12th November, 1986, see Gazette of India, Extraordinary, Part II, sec. 3(i).
- ✓ National_Green_Tribunal_Act,_2010.

15. Annexures -DBATU Master Plan Layout



PLOT NO.	SIZE	AREA (SQM)	USE
A1		38803.41	UNIVERSITY CLUB
A2		24371.59	CAMPUS SCHOOL
A3		9271.77	SHOPPING COMPLEX
A4		17707l.17	HEALTH CARE CENTER
A5		5319.06	CHILDREN'S PARK
A6		12168.15	
A7		13176.81	
A8		50785	PLAY - FIELDS
A9		8929.41	GYMNASIUM
A10		9835.66	
A11		19172.96	
A12		16506.03	
R1		11578.07	RESIDENCIAL
R2		11383.51	RESIDENCIAL
R3		11435.47	RESIDENCIAL
R4		9284.78	RESIDENCIAL
R5		12852.31	RESIDENCIAL
R6		14804.14	RESIDENCIAL
R7		14117.77	RESIDENCIAL
R8		11368.31	RESIDENCIAL
R9		11370.73	RESIDENCIAL
R10		11418.33	RESIDENCIAL
R11		14746.35	RESIDENCIAL
R12		13450.13	RESIDENCIAL
R13		16745.30	RESIDENCIAL
R14		15224.23	RESIDENCIAL
H1		37437.80	HOSTEL
H2			HOSTEL

LEGEND

ROAD		CONTOURS	740 / 15.00
CANAL		TANK,POUND	
NALA		CULVERT, BRIDGE	
EXISTING STRUCTURE		TREE , WELL	
BOUNDARY		ELECT. LINE TELE. LINE	E E E / T T T
FOREST			

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Location Plan for Proposed
Building for Workshop Shed, Teachers Training Center,
Department of Civil Engineering, Incubation Center,
PG Research Center, AICTE Funded SC/ST Girls Hostel,
for DBATU Campus at Lonere, Tal - Mangoan, Dist - Raigad