

# DETAILED GREEN AUDIT REPORT

Year-2021-22

FOR

**SAROJNI NAIDU GOVT GIRLS PG (AUTONOMOUS)  
COLLEGE**  
Bhopal, Madhya Pradesh



**CONDUCTED BY:**



**SABS INDIA**



**WE BUILDS A SOLID FOUNDATION FOR SAVING ENERGY**

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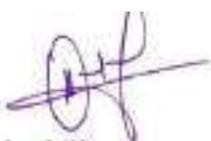
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## THE AUDIT TEAM

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<b>Project Title:</b>	<b>Green Audit</b>
<b>Organization:</b>	<b>SABS INDIA SALES CORPORATION</b>
<b>Client:</b>	<b>Sarojini Naidu Govt Girls PG (Autonomous) College</b>
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## Acknowledgement

**SABS INDIA** is thankful to the **Sarojni Naidu Govt Girls PG (Autonomous) College** for their positive support in undertaking this intricate task of Green Audit. The field studies would not have been completed on time without their interaction and timely support. We are grateful for their co-operation during field studies and provision of data for the study.

The officials of **Sarojni Naidu Govt Girls PG College** coordinated and helped to the audit team during the field study and measurement. **SABS INDIA** expresses special thanks to the following persons of **Sarojni Naidu Govt Girls P.G. College**.

1. Dr. Pratibha Singh                      Principal
2. Dr. Shobha Shrivastava              Professor
3. Dr. Surinder Kaur Batra Professor
4. Dr. Seema Pathak Professor
5. Dr. Sanjay Sahay Professor
6. Dr. Shail Bala Baghel                Professor
7. Dr. Mukesh Dixit                      Professor

And all other officers, technicians and staffs for the keen interest shown in this study and the courtesy extended.

We are thankful to the management for giving us the opportunity to be involved in this very interesting and challenging project.

We would be happy to provide any further clarifications, if required, to facilitate implementation of the recommendations.

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## Environment

“Sabs India Sales Corporation” has been awarded the “Green Building” certification by the Green Building Council of India (GBCI) for its Bhopal office. The certification is based on the Green Building Rating System (GBRS) and covers various aspects of the building's performance, including energy efficiency, water conservation, waste management, and indoor air quality. The Bhopal office has achieved a Green Building Rating of 3 stars, which is a significant achievement for a building of its size and complexity. The certification is valid for 5 years and requires the building to maintain its performance levels over time. Sabs India Sales Corporation is committed to sustainable development and is proud to be a Green Building. The certification is a testament to the company's commitment to environmental responsibility and its efforts to create a sustainable workplace. The Bhopal office is a model of sustainable design and construction, and it is a source of pride for the company. The certification is a recognition of the company's leadership in sustainable building and its commitment to environmental excellence. The Bhopal office is a Green Building, and it is a source of pride for the company. The certification is a recognition of the company's leadership in sustainable building and its commitment to environmental excellence.

The Green Building Environment Audit and Green Auditare also aimed to assess the building's performance for maintenance of the campus eco-friendly.



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# INTRODUCTION

## ABOUT THE COLLEGE

Sarojini Naidu Govt Girls P.G. College is one of the premier institutes of the state for quality education to women. Since its inception in 1970, college has achieved considerable heights in academic excellence and extracurricular perfection. College celebrated its Golden Jubilee year with full zeal and enthusiasm.

The College has been awarded A" Grade in 2017 with 3.09 points by NAAC in cycle III of Re-accreditation. After fourth review of Autonomy in 2019 further extension has been granted by the UGC. Currently the College has 6151 students enrolled in various disciplines. In 2020-21 total admission in UG courses is 1876 and 844 in PG Courses. Under Graduate courses are running in 5 faculties, namely Arts, Commerce, Science, Home Science and Computer Application. Post Graduate programs are successfully running in 19 subjects along with 8 self-financing courses.

The green audit conducted in **Sarojini Naidu Govt Girls PG College** is an External audit that aims towards looking after a healthy environment. Though emerging, the initiative is taken up to substitute the concept of environmental sustainability.

## (A) AUDIT FRAMEWORK

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 institute which will lead for sustainable development. Green Audit is a planned identification, data analysis and reporting of mechanisms of environmental diversity. The "Green Audit" aims to analyze environmental practices within and outside the college campus, which will have an impact on the eco-friendly environment.

### Duration of the Green Audit

The Green audit field observations data collection was carried in September 2021.

## (B) OBJECTIVE OF THE GREEN AUDIT

The institute, with the advice of the External Quality Assessment Cell (IQAC) has set up an environmental quality assessment Team that aimed at performing the green audit of the College. The main objectives of the audit are:

- To fulfill the Institution's responsibility towards reducing carbon footprint and contribute to environmental protection.
- To promote Environmental Consciousness and Responsibility among students.
- To implement green practices consistently and effectively towards creating a sustainable campus.
- To monitor and evaluate the green practices, towards a sustainable campus
- To generate innovative green practices, promoting the spirit of eco-innovation among students.

### **(C) METHODOLOGY**

The Green Audit taken up by Sarojni Naidu Govt Girls PG College has been divided into Three stages:

- Data/ /Observation
- Analysis of finding
- Recommendations

### **(D) DIVISION OF AUDIT**

**For better investigation and pinpoint observation our team has divided this work in 6 parts**

# 1. CHAPTER

## GENERAL OVERVIEW OF THE CONCEPT OF LANDUSE

Land use refers to man's activities and the various uses which are carried on and derived from land. Viewing the earth from space, it is now very crucial in man's activities on natural resource. In situations of rapid changes in land use, observations of the Earth from space give the information of human activities and utilization of the landscape.

Remote sensing and GIS techniques are now providing new tools for advanced land use mapping and planning. The collection of remotely sensed data facilitates the synoptic analyses of earth system, functions, patterning, and change in the local, regional as well as at global scales over time. Satellite imagery particularly is a valuable tool for generating land use map.



Figure 1: Sarojni Naidu Govt Girls P.G College Satellite View

### 1.1 Methodology Adopted For Land Use Mapping

Three types of data that are GPS points, field survey data and Google earth data for Geo referencing have been used in this study. Land use map of the study area have been prepared using the above three types of data with the help of ArcGIS Pro software.

## 1.2 Data Processing And Analysis

Land use map preparation is executed through the following steps:

Acquisition of data, Geo-coding and Geo referencing of satellite imageries by extracting the ground control points. Supervised classification was carried out with the aid of ground truth data collected during field survey. Scanning and digitization of maps and editing of all the Geo referenced maps were done using GIS. Data manipulation and analysis and linking the spatial data with the attribute data for creation of topology was carried out using GIS software. Creation of GIS output in the form of land use map showing various land use have been prepared.

Therefore, attempt has been made in this study to map land use for Geography Department of with a view to detect the land consumption in the built-up land area using both remote sensing and GIS techniques.

## 1.3 Geographical Location With Campus Map In Scale

The college has a **sprawling pollution-free campus spread over 6.68 acres** of land in the heart of District. It has an ideal geographical location with the approximately to the important cities of the region The college is located at 7 km from Railway Station, 17 km from Bhopal airport. Scaled image of college campus is shown. Green color in Map is representing green area. The Google aerial views of College Campus has been shown in figure.

Land use drawing of campus is attached below.

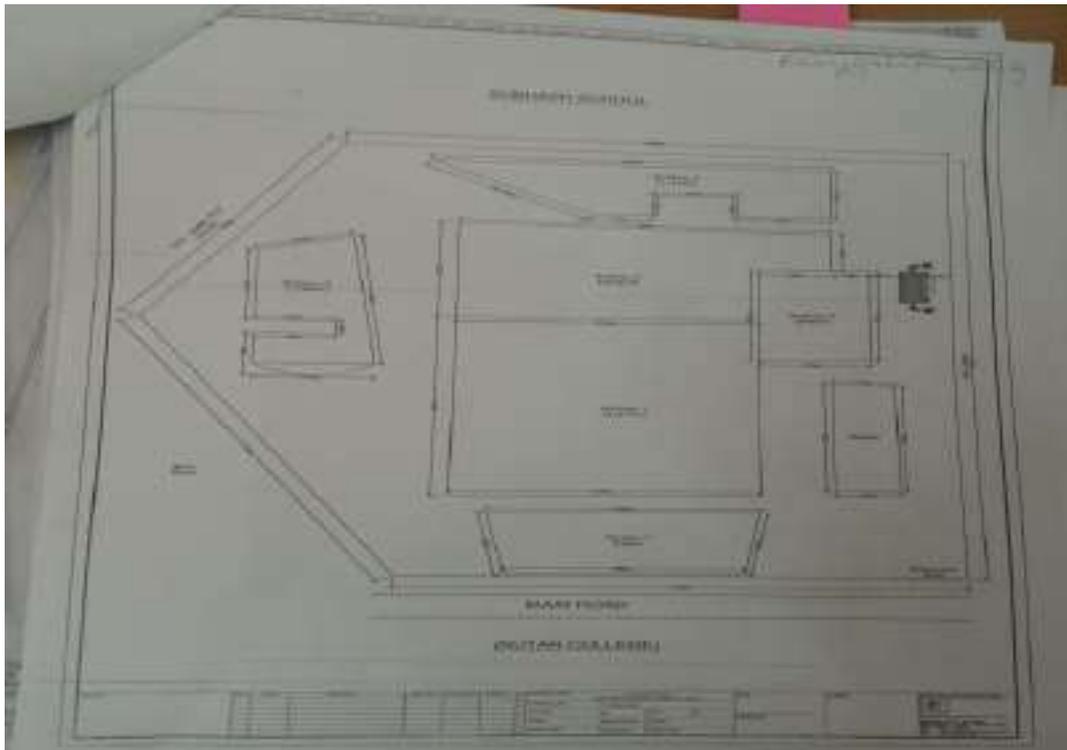


Figure 2: Land Use Drawing

## 2. CHAPTER AIR QUALITY AUDIT

### 2.1 Data/Observations

Air quality in the academic college is very significant for creating good educational atmosphere as well as for the health of the students, faculty, staff and other stake holder of the institute. Being situated in the heart of the city, our college is exposed to various atmospheric pollutants from vehicles as well as by other external means of urban areas, but mainly turn proves us that vehicles may contribute to high carbon dioxide emission.

Table 1 :Air Quality Data of The Location of Past Three Months On Selected Date

Air Quality Data of The Location of Past Three Months On Selected Date									
Date	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	O <sub>3</sub>	CO	NO <sub>3</sub>	AQI	Category
01-07-2021	23.6	14.17	67.79	17.67	46.63	0.65	23.6	67.79	<b>SATISFACTORY</b>
03-07-2021	25.16	28.7	102.38	20.08	45.26	0.63	25.16	101.91	<b>MODERATE</b>
09-07-2021	27.61	17.3	101.38	25.83	46.14	0.79	27.61	101.25	<b>MODERATE</b>
11-07-2021	30.32	16.15	60.33	21.21	55.67	0.68	30.32	60.33	<b>SATISFACTORY</b>
19-07-2021	26.13	22.55	38.13	10.92	34.01	0.47	26.13	38.13	<b>GOOD</b>
21-07-2021	25.17	26.27	54.33	16.21	22.37	0.54	25.17	54.33	<b>SATISFACTORY</b>
23-07-2021	25.38	21.16	47.38	20.17	45.79	0.42	25.38	47.38	<b>GOOD</b>
30-07-2021	23.16	26.08	38.63	9.83	23.75	0.49	23.16	38.63	<b>GOOD</b>
01-08-2021	23.68	27.92	31.46	9.58	29.45	0.87	23.68	43.5	<b>GOOD</b>
03-08-2021	23.22	26.01	35.13	10.67	29.28	1.26	23.22	59.71	<b>SATISFACTORY</b>
05-08-2021	24.28	27.77	47.25	19.33	27.33	0.58	24.28	47.25	<b>GOOD</b>
09-08-2021	25.82	25.59	61.58	22.46	34.37	0.84	25.82	61.58	<b>SATISFACTORY</b>
11-08-2021	27.32	26.33	89.21	25.42	33.51	0.77	27.32	89.21	<b>SATISFACTORY</b>
19-08-2021	27.39	20.11	47.96	21.17	28.29	0.82	27.39	47.96	<b>GOOD</b>
21-08-2021	23.62	14.06	38.96	16.71	31.31	0.67	23.62	38.96	<b>GOOD</b>
28-08-2021	26.45	15.25	105.21	26.29	38.95	0.88	26.45	103.78	<b>MODERATE</b>
30-08-2021	32.16	10.24	47.79	22.92	27.6	0.93	32.16	47.79	<b>GOOD</b>
01-09-2021	28.04	16.46	34.33	12.75	23.79	0.57	28.04	35.05	<b>GOOD</b>
03-09-2021	26.12	20.97	41.87	13	31.55	0.75	26.12	41.87	<b>GOOD</b>
09-09-2021	22.34	18.56	24.63	7.56	34.55	0.53	22.34	34.55	<b>GOOD</b>
11-09-2021	21.17	14.59	30.96	7.41	35.75	0.46	21.17	35.75	<b>GOOD</b>
19-09-2021	21	14.51	40.5	17.25	40.98	0.41	21	40.98	<b>GOOD</b>
21-09-2021	23.3	21.59	50	15.33	35.01	0.61	23.3	50	<b>GOOD</b>

Source:MP Pollution Control Board, Bhopal

## 1.2 Finding

From the above study on air quality during these times air quality is good most of the times, sometimes satisfactory and a few times moderate, which indicates low pollution most of the times.

Study shows the changes in air quality due to regulatory parameters which includes Sulphur di oxide, nitrogen per oxide and particle matter.

PM<sub>10</sub> is **more than standard value on 09/07/21 and 28/08/21**. All other parameters were within permissible range air quality index inside and around the college campus was better than other parts of the city, mainly because of the greenery&also students prefer public transport to commuteMost students use public transport for commuting since the college is well connected by public transport secrecies as local bus service Use of Bicycles and public transport is encouraged by the institute amongst the students., faculty members, office staff residing nearby are encouraged to come by bicycles, or public transport which help in reduction of the release of carbon-dioxide in the campus.

## 1.3 Recommendation

College has campus of 6.68acres Cover of trees, number of garden and greenery in campus beautify the campus and automatically neutralize carbon footprint. College has already taken some steps like Plantation of local and common plant species, arranges special programs by inviting the eminent personalities for environmental consciousness of teaching and nonteaching staff in college as well as student, cleaning and beautification of our campus by various activities through various units. The college should plant different types of large number of trees in the campus, this greenery in campus helps to neutralize the carbon products generated. There should be ban on the entry of vehicles in college premises.

# 3. CHAPTER

## WATER AUDIT

### 3.1 Introduction

Water is a natural resource, all living matters depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. We need to use water wisely to ensure that drinkable water is available for all, now and in the future. A small drip from a leaky tap can waste more than 180 liter of water in a day. It is therefore essential that any environmentally responsible institution should examine its water use practices. Water audit improves the knowledge and documentations of distribution system:

- It leads to reduce water losses.
- It improves financial performance.
- Efficient use of existing water.

The concerned auditor investigates the relevant method that can be adopted and improved to balance the demand and supply of water.

### 3.2 Observation

#### Questioner for data collection

**1) What are the uses of water in college?**

**Answer-**Drinking, Washing, Toilet, Lab, Garden, Canteen, Hostel, Staff quarter.

**2) What are the sources of water in college?**

**Answer-**The main source of water is Municipality water.

**3) No. of motors used for pumping water ?**

**Answer-** There are two motors in college both are in working condition. One is for the daily use and the other is for emergency.

**4) Is there any water collection and recharge system.**

**Answer-** Yes , there is water collection and recharge system for waste water coming from water cooler and taps .This recharge system is located in such position that ground rain water also collected in it .After filtration this water goes to ground.

**5) Is there any Wastage of water?**

**Answer-**No, there is no major wastage of water, 1. No leakage from Taps, 2. No wastage from over flowed tanks 3. Some wastage from water cooler.

**6) Is there any treatment plant for the lab water?**

**Answer-**No there is no treatment plant for the lab water .As water drains out in a pit and goes to ground.

**7) What is the Capacity of tank?**

**Answer-** 28000 liters approximately.

**8) No. of water coolers in college campus.**

**9) Answer-**There are 13 water coolers in college campus-

**10) No. of Toilet.**

**Answer-**

Table 2: Toilet Details

S.no.	No. of Toilet	Leaking Taps
1	28	0

**11) Any water used in agriculture purpose.**

**Answer-**Yes in garden.

**12) Does college harvest rain water?**

**Answer-** Yes, there is rain water harvesting system in Campus.

**13) Is drip irrigation used to water plants outside?**

**Answer-** No

**14) Some idea for how your college could save more water.**

**Answer -a)** Stop leakage of water from taps.

b) Use minimum water needed for daily needs.

c) Immediately turn off the, taps after washing hands.

d) Renew water ball for water tanks to 100% prevent the waste of water.

Saving water helps to preserve our environment. It reduces the energy required to process and deliver water, which helps in conserving resources.

**3.3 Key findings:-**

1. Main water uses in the campus.

a)Garden

b) Lab

c) Cleaning

d) Drinking

e)Toilet

g) Washing

2) No water treatment system in Place

- 3) No. of water cooler = 3
- 4) No. of toilet = 28
- 5) No. of water pump = 2
- 6) Municipal water connection - Yes
- 7) Using water from own well - No
- 8) No. of water tank for water storage = 1
- 9) Amount of water stored = 28000 Liters

#### **Reason for water wastage –**

- 1) There is no water consumption monitoring system in the college campus.
- 2) The college does not have waste water treatment plant for waste water, generated from laboratories, canteen, hostel, Toilets.
- 3) There is rain water harvesting system in building. Need of more system in every building of college.
- 4) Automatic switching system is not installed for pump sets used for overhead tank filling.

#### **Recommendations-**

- 1) Remove old taps and install sensitive taps if possible.
- 2) Drip irrigation for gardens and vegetable cultivation can be initiated.
- 3) Establish rain water harvesting system for each building.
- 4) Water treatment system.
- 5) Awareness program on water conservation to be conducted.
- 6) Install display boards to control over exploitation of water.

### **3.4 Rain Water Harvesting System**

Rainwater Harvesting in proper way can be a permanent solution of the problem of water crises. This simple method can put forward a solution. This will be workable in areas where there is sufficient rain but ground water supply is not sufficient on the one hand and on the other, surface water resource is insufficient.

The College Sarojni Naidu Govt Girls P.G. College, Bhopal is one of the old and biggest Institutes of city as well as the state. It has 6.68 acres of land with more than 6150 students. The college has a lot of need of water and rain water harvesting can fulfill the demand of the requirement.

## Rain water Harvesting System



Figure 3: Rain water harvesting system

## 4 CHAPTER

### TREE DIVERSITY OF COLLEGE CAMPUS

Objective - The main objective of green audit is to enlist and enumerate the plant diversity of college campus. This is a continuous process and helps in maintenance and conservation of flora of campus.

This study was undertaken with following objectives –

- (a) To identify the plantspecies growing in the area.
- (b) To make a habit wise list along with their frequency.
- (c) To generate basic data for further reference.
- (d) To create awareness among students.

#### **a. Methodology**

Phytodiversity of campus wasstudied by Department of Botany of college, and students of M.Sc. Botany The investigative team comprised of College campus is spread into an area of 6.68 acres it was divided into parts. Different team visited these areas and noted name and number of plant species . This data was then cumulated and tabled.

#### **b. Presentation of Data**

The data was categorized on the basis of habits. Grasses and sedges were innumerable so their names were mentioned. In addition to angiospermic plants, other groups were also represented for eg.algae (Diatoms, Oscillatoria,Spirogyra, Vaucheria), fungi, bryophytes(Riccia,Polytrichum, Cyathodium), Pteridophyta(Pteris ), gymnosperms ( Cycas,Juniperus, Araucaria,Thuja)

Result – This campusharbors a rich diversity of plants. It is an old institution \ and hence some members of natural vegetation are still present here. Some plants are introduced for avenue purpose and are combined to the road facing area.

Table 3: List of Trees

S.No	Plant Species	Specification
1	<p><b>Pongamia pinnata A.Cunn.</b></p> 	<p><b>Family-</b> Papilionaceae  <b>Hindi name-</b>Karanja  <b>English name-</b> Indian Beach</p>
2	<p><b>Polyalthia longifolia Thw</b></p> 	<p><b>Family-</b>Annonaceae  <b>Hindi name-</b> Ashok  <b>English name-</b> False ashok</p>
3	<p><b>Azadirachta indica A. Juss.</b></p>	

		<p><b>Family-</b>Meliaceae  <b>Hindi name-</b>Neem  <b>English name-</b> The Margosa Tree</p>
4	<p><i>Ailanthus excelsa</i> <b>Roxb.</b></p> 	<p><b>Family-</b>Simaroubiaceae  <b>Hindi name-</b> Mahaneem, Mahrukh  <b>English name-</b> Heavens Tree</p>
5	<p><i>Butea monosperma</i> (<b>Lam.</b>)</p> 	<p><b>Family-</b> Papilionaceae  <b>Hindi name-</b> Palash  <b>English name-</b> Flame of the forest</p>
6	<p><i>Dalbergia sissoo</i> <b>Roxb</b></p>	

		<p><b>Family-</b>Papilionaceae</p> <p><b>Hindi name-</b>Shisham</p> <p><b>English Name-</b></p>
7	<p><i>Cassia siamea</i> Lam.</p> 	<p><b>Family-</b>Caesalpiniaceae</p> <p><b>Hindi name-</b></p> <p><b>English name-</b> cassod tree</p>
8	<p><i>Cassia fistula</i> L.</p> 	<p><b>Family-</b> Caesalpiniaceae</p> <p><b>Hindi name-</b>Amaltas</p> <p><b>English name-</b> Indian Laburnu</p>
9	<p><i>Emblica officinalis</i> Gaertn.</p>	

		<p><b>Family-</b>Euphorbiaceae  <b>Hindi name-</b>Aola, Amla  <b>English name-</b>Emblicmyrobolan</p>
10	<p><i>Murraya exotica L.</i></p> 	<p><b>Family-</b><i>Rutaceae</i>  <b>Hindi name-</b>Kamini  <b>English name-</b></p>
11	<p><i>Moringa oleifera Lam</i></p> 	<p><b>Family-</b>Moringaceae  <b>Hindi name-</b>Sainjha  <b>English name-</b> Drumstick tree</p>
12	<p><i>Alstoniascholaris(L.) R. Br.</i></p>	

		<p><b>Family-</b>Apocynaceae  <b>Hindi name-</b>Satparni  <b>English name-</b> Scholars Tree</p>
13	<p><i>Samanea saman (Jacq.) Merr.</i></p> 	<p><b>Family-</b> Mimosaceae  <b>Hindi name-</b>Vilayati siris  <b>English name-</b>Rain Tree</p>
14	<p><i>Peltophorum ferrugineum (Decne) Benth.</i></p> 	<p><b>Family-</b>Caesalpiaceae  <b>Hindi name-</b>Peltoforum  <b>English name-</b>Yellow Flame Tree</p>
15	<p><i>Putranjivaroxburghii Wall.</i></p>	

		<p><b>Family-</b> Euphorbiaceae  <b>Hindi-</b>Jalpitri, Putranjia  <b>English name-</b> Mild Olive tree</p>
16	<p><i>Zizyphus jujuba Lamk.</i></p> 	<p><b>Family-</b>Rhamnaceae  <b>Hindi name-</b>ber  <b>English name-</b>Indian Jujube</p>
17	<p><i>Delonix regia (Boj.) Rafin.</i></p> 	<p><b>Family-</b>Caesalpiaceae  <b>Hindi name-</b>Gulmohar  <b>English name-</b>Flamboyant tree</p>
18	<p><i>Millingtonia hortensis L.f.</i></p>	

		<p><b>Family-</b>Bignoniaceae  <b>Hindi name-</b>Akashneem  <b>English name-</b>Jasmine Tree</p>
19	<i>.Plumaria</i>	
		<p><b>Family-</b>Apocinaceae  <b>Hindi name-</b>Champa  <b>English name</b></p>
20	<i>Mangifera indica L.</i>	
		<p><b>Family-</b>Anacardiaceae  <b>Hindi name-</b>Aam  <b>English name-</b>Mango</p>
21	<i>Bauhinia variegataL.</i>	

		<p><b>Family-</b>Caesalpiaceae  <b>Hindi name-</b>Kachnar  <b>English name-</b></p>
22	<p><i>Terminalia catappa</i> <b>Linn.</b></p>	
		<p><b>Family-</b>Combretaceae  <b>Hindi name-</b>JungliBadam  <b>English name-</b> Indian Almond</p>
23	<p><i>Ficus benghalensis</i> <b>L.</b></p>	
		<p><b>Family-</b>Moraceae  <b>Hindi name-</b>Bargad, Barh  <b>English name-</b> The Banyan</p>
24	<p><i>Ficus religiosa</i> <b>Linn.</b></p>	

		<p><b>Family-Moraceae</b></p> <p><b>Hindi name-Pipal</b></p> <p><b>English name-</b></p>
25	<p><i>Tamarindus indica L.</i></p>	
		<p><b>Family-Caesalpinaceae</b></p> <p><b>Hindi name-Imli</b></p> <p><b>English name- Tamarind</b></p>
26	<p><i>Melia azedarach L.</i></p>	
		<p><b>Family-Meliaceae</b></p> <p><b>Hindi name-Bakain</b></p> <p><b>English name- Persian Lilac</b></p>
27	<p><i>GrevilliarobustaCunn.</i></p>	

		<p><b>Family - Proteaceae</b></p> <p><b>Hindi name-</b></p> <p><b>English name-</b> Silver Oak</p>
28	<p><i>Murrayakoenigii</i> L.</p> 	<p><b>Family-Rutaceae</b></p> <p><b>Hindi name-</b>Meetha neem, Kadaipatta</p> <p><b>English Name-</b></p>
29	<p><i>Psidium guajava</i> L.</p> 	<p><b>Family-Myrtaceae</b></p> <p><b>Hindi name-</b>Amrood</p> <p><b>English name-</b>Guava</p>
30	<p><i>Pithecellobium dulce</i> (Roxb.) Benth.</p>	

		<p><b>Family-</b>Mimosaceae  <b>Hindi name-</b>Jungle Jalebi  <b>English name-</b></p>
31	<p><i>Santalum album L.</i></p> 	<p><b>Family-</b>Santalaceae  <b>Hindi name-</b>Chandan  <b>English name-</b>Sandal Wood tree</p>
32	<p><i>Tecoma stans (L.) H.B. &amp; k.</i></p> 	<p><b>Family-</b>Bignoniaceae  <b>Hindi name-</b>Tecoma  <b>English name-</b></p>
33	<p><i>Gliricidamaculata H.B.k.</i></p>	

		<p><b>Family-</b>Papillionaceae  <b>Hindi name-</b>Vilayti siris  <b>English name-</b>Madre Tree</p>
34	<p><i>Thevatianeriifolia</i></p> 	<p><b>Family-</b>Apocynaceae  <b>Hindi name-</b> PeelaKaner  <b>English Name-</b> Yellow Oleander</p>
35	<p><i>Pinus roxburghii</i></p> 	<p><b>Family-</b> Pinaceae  <b>Hindi name-</b> Chir  <b>English Name-</b> Pine tree</p>
36	<p><i>Nyctanthes arbor-tristis L.</i></p> 	<p><b>Family-</b>Nyctanthaceae  <b>Hindi name-</b>Harsingar  <b>English name-</b>Tree of sorrow</p>
37	<p><i>Eucalyptus citrodora Hook.</i></p>	

		<p><b>Family-Myrtaceae</b>  <b>Hindi name— Nilgiri</b>  <b>English name-</b></p>
38	<p><i>Ciccaacida (L.) Merr</i></p> 	<p><b>Family-Euphorbiaceae</b>  <b>Hindi name-Harfar Rewari</b>  <b>English name-</b></p>
39	<p><i>Casurinaequisetifolia</i></p> 	<p><b>Family-Casurinaceae</b>  <b>Hindi name-Jhhau</b>  <b>English name-</b></p>

**Recommendations-**

- Geo tagging of all trees should be done.
- Each and every tree should be well documented.

**5 CHAPTER**

# ENERGY AUDIT

## 5.1 Data/Fact

Alternate Energy initiatives such as: Power requirement of the Institution met by the renewable energy

Table 4 : Savings by Solar System installed in campus

Month	Total units consumed	Total units supplied	Units generated by solar	Per unit energy charges	Saving
	KWH	KWH	KWH	Rs	Rs
Dec-20	2699	532	2167	7.45	16144
Jan-21	2316	459	1857	7.45	13835
Feb-21	1946	509	1437	7.45	10706
Mar-21	2231	480	1751	7.45	13045
Apr-21	1698	464	1234	7.45	9193
May-21	1274	366	908	7.45	6765
Jun-21	4874	1271	3603	7.45	26842
Jul-21	5641	3340	2301	7.45	17142
Total Units (KWH) generated by solar			<b>15258</b>	Total Savings in Rs.	<b>113672</b>

## 5.2 Finding

Total lighting load	Percentage lighting through LED bulbs	Percentage lighting through Others sources
31352W	18%	82%

Total Fan Load	Percentage Fan load by BLDC Fans	Percentage Fan through Others type of Fans
33KW	0%	100%

## Recommendation-

- Power by renewable energy sources must be added in campus.
- LED lights should be used at all places.
- BLDC Fans should be used instead of conventional ones.

Note – We appreciate use of LED lights at some places in the campus.

## 6 CHAPTER WASTE AUDIT

### a. Solid waste

- **Fact –**

Waste is produced by all types of routine activities carried out in the college that includes waste papers, parts of trees, leaf, poly bags plastics, glass, food products, etc.

- **Finding-**

Reduce-Reuse-Recycle is the root of sustainable development and qualitative human life with green environment, college strongly believes in this philosophy.

**Reuse:** Reuse of waste materials and recycling of those

**Recycle:** Organic waste material like parts of trees, leaf litters collected & dump in compost pits. This compost pit is in Botany Dept. This waste convert is to compost & reuse as a manure in garden for campus.

The waste papers from college centrally collected answer sheets and question papers from Autonomous Dept. Practical records collected from science laboratory. Newspapers and magazines from library, etc. The Institute has outsourced a Vendor to dispose of all the Answer Sheets, News Papers and other Paper Material. The Vendor recycle the paper as per the agreed the vendor. All paper waste given to vendors for recycling at regular intervals.

The waste is separated at each level and source. Throwing the waste anywhere is strictly prohibited. Usage of plastic bags is discouraged within the premises of the College. Dustbins are provided throughout the campus. The administrator in each building confirms that the waste in each floor is collected at selected time to time. The staff in each floor collects, clean, segregates and compiles the waste in the Green & Blue dustbins provided at each floor. The floor dustbins are covered and easily portable. Dry garbage from college campus collected by hour keeping staff from different collection point (from different lab, office, hostel.) Bhopal Municipal Corporation has system to collect the garbage daily from the Institute campus solid waste. The primary goal of solid waste management is reducing and eliminating adverse impacts of waste materials on human health and environment to support economic development and superior quality of life. The entire campus is duly cleaned regularly by sweepers and cleansing works.



Figure 4 :Organic Waste Management unit (Dept of Botany)

## b. Liquid Waste

Well-constructed drainage system leading to the IMC constructed chambers is there in place within the campus. Liquid waste is duly discharged by means of underground well laid pipe lines. Institute regularly contact

Butthe college does not have waste water treatment plant for waste water, generated from laboratories, canteen, hostel, Toilets.

### **Recommendations for Liquid Waste Management:**

Water Treatment System should be Place in college campus

## c. E waste

E-waste: The E-waste is collected separately than the other type of waste generated in the campus. Separated E-waste is deposited in the separate box provided for the same purpose.