

## Green Audit Certificate

Ref.No. SABs /GA/22-23/217

Dated 31/05/2023

### GREEN AUDIT Certificate



This is to certify that Vijayaraje Govt. Girls P.G. College Morar, Gwalior (M.P.) has conducted, Green Audit in the academic year 2022 - 2023 to assess the environmental initiative planning, efforts, activities, implemented in the college campus like Plantation, Rain Water Harvesting, Plastic ban, Conservation of Energy, Energy Management and various Green Awareness activities. **Sabs Energy Enviro pvt ltd** has verified campus data of Vijayaraje Govt. Girls P.G. College Morar, Gwalior (M.P.) This Green Audit are also aimed to assess impact of environmental development initiatives for maintenance of the campus eco-friendly.

**Mr. Sanjay Singh**

**A P: Indian Green Building council Green Building Consultant**  
EA 1462 Bureau of Energy efficiency  
Ministry of Power Govt. of India

**Save Energy save Nation**



  
**ICAC**  
**CO-ORDINATOR**  
Vijaya Raje Govt Girls PG College  
Morar-Gwl

# Green Audit Voucher

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# GREEN AUDIT REPORT

## YEAR- 2022-23



**VIJAYA RAJE GOVT. GIRLS P.G. COLLEGE MORAR,**  
**DISTT. GWALIOR (M.P.)**  
Madhya Pradesh, India

**CONDUCTED BY:**



**SABS ENERGY ENVIRO PVT.LTD.**



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## Acknowledgement

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The officials of Vijaya Raje Govt. Girls P.G. College Morar, Gwalior (M.P.) coordinated and helped to the audit team during the field study and measurement. Sabs Energy Enviro Pvt. Ltd. expresses special thanks to the following persons of Vijaya Raje Govt. Girls P.G. College Morar, Gwalior (M.P.)

1	Principal	<b>Dr. Sushila Mahor</b>
2	IQACIn-charge	<b>Dr. S.K. Shrivastava</b>
3	Accountant	<b>Mr. Matacharan Sharma</b>
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6	Prof. – Physics	<b>Mr. R.K. Dandoliya</b>

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.

**SABS ENERGY ENVIRO PVT.LTD.**

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## Table of Contents

1.1	CHAPTER : 1 .....	8
	ABOUT THE COLLEGE .....	8
1.1	Audit Framework.....	9
1.2	Objective of the Green Audit .....	9
1.3	Methodology .....	10
1.4	Division of Audit.....	10
	CHAPTER :2.....	11
	GENERAL OVERVIEW OF THE.....	11
	CONCEPT OF LAND USE .....	11
2.1	Introduction .....	11
2.2	Methodology Adopted For Land Use Mapping .....	11
2.3	Data Processing and Analysis.....	11
2.4	Geographical Location with Campus Map in Scale .....	12
2.5	Data Processing and Analysis.....	12
	CHAPTER :3.....	13
	TREE DIVERSITY OF COLLEGE CAMPUS.....	13
3.1	Objective: .....	13
3.2	Methodology .....	13
3.3	Result.....	13
	Recommendations-.....	22
	CHAPTER : 4.....	30
	FAUNA DIVERSITY .....	30
4.1	Introduction .....	30
4.2	Observations and Recommendations .....	31
	GREEN PLANTATION IN THE CAMPUS.....	23
	CHAPTER: 5.....	39
	GREEN ENERGY UTILISATION.....	39
5.2	Recommendation.....	39

## List of table

Table 1: List of Trees.....	14
Table 2: Various Types of Trees in College.....	19
Table 3: <b>List of Shrubs grass and bale</b> .....	21
Table 4: <b>List of Grass</b> .....	22
Table 5: <b>List of all the Birds in the campus</b> .....	31
Table 6: <b>List of all the Fauna in the campus</b> .....	38

## List of figure

Figure 1: Vijaya Raje Govt. Girls PG College Morar, Gwalior view.....	10
Figure 1: Vijaya Raje Govt. Girls PG College Morar, Gwalior Satellite View .....	11
Figure 3: Main front garden of college.....	23
Figure 4: plant/ trees at garden of college.....	24
Figure 5: Trees at college Campus .....	26
Figure 6: Plantation activity at college Campus .....	27
Figure 7: Plantation activity with NCC cadets at college Campus.....	29



## **CHAPTER: 1**

### **ABOUT THE COLLEGE**

Vijaya Raje Govt. Girls P.G. College Morar, Gwalior (M.P.) has been founded with an objective to promote higher education among girls, who belong to rural areas in Madhya Pradesh and bordering states. They are imparted qualitatively optimum education at minimum fees. A great deal of emphasis is laid on inculcating in them a sense of responsibility and ethical values. Moreover, the students are taught various skills which grooms up their entrepreneurial skills to shape them up as self-employed individuals eventually. In addition to academic pursuits the students are also inspired to participate in various co-curricular activities and interact with other sports clubs. Industrial visits are also conducted impart the desired exposure to them.

In order to uplift the social stature of students, they are given empirical knowledge enabling them to understand the realistic approach towards all the challenges that they confront in their lives. It is quite evident that educating a girl is akin to educate the entire family. Keeping in view the fulfillment of the cherished ambition of students, the right kind of platform is created. It is one of the prime objectives of the institute to promote Indian traditional values and in view of this aim regional festivals are celebrated at the college frequently, every day Vijaya Raje Govt. Girls P.G. College Morar, Gwalior starts with morning prayers. In keeping with much valued cultural ethics and to maintain equanimity,

#### **Vision:**

To empower women with excellent education, inclusiveness, empathy, self-reliance and respect for Indian culture.

#### **Mission:**

- To provide quality education with traditional values for the holistic development of women especially from weaker section of society.
- To nurture human skills and augment national consciousness.
- To prepare them to face the challenges of modern, technological and globalizing world.
- To sensitize them with social and environmental issues.

#### **Goals & Objective:**

We consider women a major force in the development process of the society. Women's empowerment is the sine qua known for social progress and stability of the Nation. Education is an important instrument in the development of human resources. For us imparting quality education is a mission. Our vision is to build our institution into a modern and progressive center serving the society by providing quality education in emerging areas to women enabling them to play a meaningful role in the 21st century. Our motto is social growth and stability through empowerment of women by using education as a tool of human resource development.

- To develop new academic courses and revise current academic programmes to keep place with the changing scenario.
- To vocationalize courses.
- To enhance and promote excellence in teaching and learning.
- To encourage and support innovation in teaching and learning.
- To develop a systematic approach for the success of students.
- To create an ICT infrastructure that is supportive of academic and administrative needs.
- To promote computer competency for students and faculty and staff.
- To provide supportive services to students.
- To increase awareness of student support services, policies and campus events among students.
- To maintain an administrative information system that is useful integrated and user friendly.
- To promote communication, cooperation and shared decision making among administrative and academic departments.
- To support and encourage staff for personal academic growth.
- To Support & encourage students for co-curricular activities.
- To provide a clean accessible environment, this meets the needs of students faculty and staff.
- To promote a spirit of community service among students, faculty and staff.
- To ensure and sustain the institutional standards to highest level.
- The goals and objectives are communicated to students and parents by following means
- The mission and vision statements are printed in prospectus.
- At the time of counseling for admission these are explained to parents.

## 1.1 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.

## 1.1 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.

## 1.2 Methodology

The Green Audit taken up by Vijaya Raje Govt. Girls P.G. College Morar, Gwalior ,has been divided into Three stages:

- Data//Observation
- Analysis of finding
- Recommendations

## 1.3 Division of Audit

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

The college has adopted the 'Green Campus' system for environmental conservation and sustainability. There are main three pillars i.e. zero environmental foot print, positive impact on occupant health and performance and 100% graduates demonstrating environmental literacy. The goal is to reduce CO2 emission, energy and water use, while creating atmosphere where students can learn and be healthy



Figure 1: Vijaya Raje Govt. Girls P.G. College Morar, Gwalior view



## CHAPTER:2

# GENERAL OVERVIEW OF THE CONCEPT OF LAND USE

### 2.1 Introduction

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.

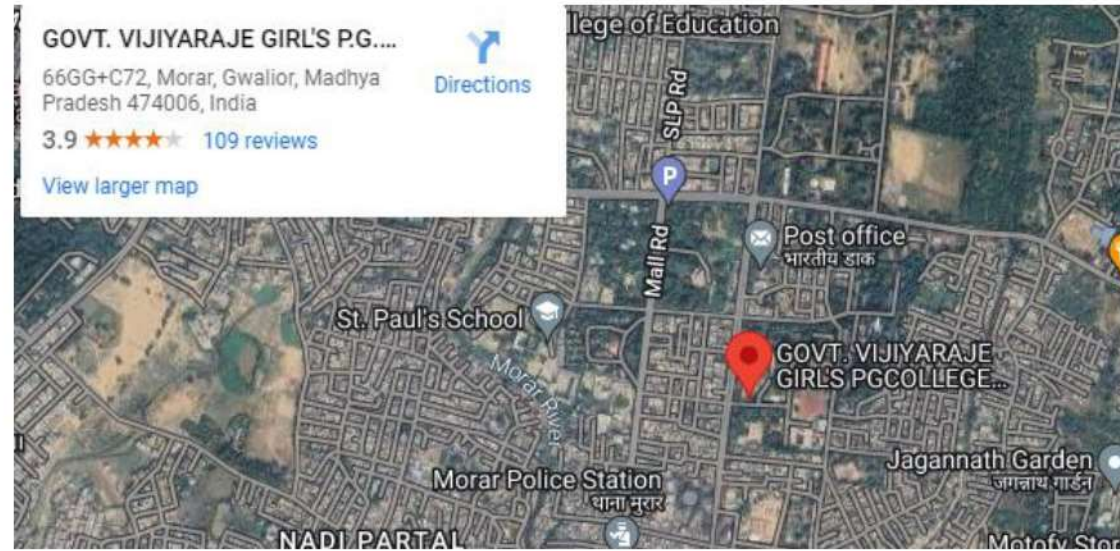


Figure 2: Vijaya Raje Govt. Girls P.G. College Morar, Gwalior Satellite View

### 2.2 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.

### 2.3 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.

## 2.4 Geographical Location with Campus Map in Scale

The college has as **prawling pollution-free campus spread over 21 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 Gwalior Railway Station. Scaled image of college campus is shown. Green color in Map is representing green area. The Google aerial view of College Campus has been shown in figure.



## 2.5 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.

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## CHAPTER:3

### TREE DIVERSITY OF COLLEGE CAMPUS

#### 3.1 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 plant species 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.

#### 3.2 Methodology

Photo diversity of campus was studied by the investigative team. 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.

#### 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. fungi, Pteridophyta (Pteris), gymnosperms (Cycas, Juniperus, Araucaria, Thuja )




#### 3.2 Result

This campus harbors 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 1: List of Trees




S.No	Plant Species	Specification
1	<b>Polyalthialongifolia Thw</b>	
		<b>Family-Annonaceae</b> <b>Hindi name- Ashok</b> <b>English name- False ashok</b> <b>No. of trees -</b>
2	<b>Azadirachta indica A. Juss.</b>	
		<b>Family-Meliaceae</b> <b>Hindiname-Neem</b> <b>English name- The Margosa Tree</b> <b>No. of trees -</b>
3	<b>Dalbergia sissoo Roxb</b>	
		<b>Family-Papilionaceae</b> <b>Hindi name-Shisham</b> <b>EnglishName-</b> <b>No. of trees -</b>
4	<b>Cassia fistula L.</b>	

		<p>Family- Caesalpiniaceae  Hindi name-Amaltas  English name- Indian Laburnu  No. of trees -</p>
5	<i>Emblica officinalis Gaertn.</i>	
		<p>Family-Fabaceae  Hindi name- Amla  English name-Vachellianilotica  No. of trees -</p>
6	<i>Moringa oleifera Lam</i>	
		<p>Family-Moringaceae  Hindi name-Surjanafali  English name- Drumstick tree  No. of trees -</p>
7	<i>Delonix regia (Boj.) Rafin.</i>	



		<p>2.1 Family-Caesalpinaceae</p> <p>Hindi name-Gulmohar</p> <p>English name-Flamboyanttree</p> <p>No. of trees -</p>
8	Mangifera indica L.	
		<p>Family-Anacardiaceae</p> <p>Hindi name-Aam</p> <p>English name-Mango</p> <p>No. of trees -</p>
9		
10	Ficus benghalensis L.	



		<b>Family-Moraceae</b> <b>Hindi name-Bargad, Barh</b> <b>English name- The Banyan</b> <b>No. of trees –</b>
11	<b><i>Ficus religiosa Linn.</i></b>	
		<b>Family-Moraceae</b> <b>Hindi name-Pipal</b> <b>English name-</b> <b>No. of trees –</b>
12	<b><i>Murrayakoenigii L.</i></b>	
		<b>Family-Rutaceae</b> <b>Hindi name-Meethaneem, Kadaipatta</b> <b>English Name-</b> <b>No. of trees -</b>
13	<b><i>Psidium guajava L.</i></b>	

		Family-Myrtaceae Hindi name-Amrood English name-Guava No. of trees –
14	Santalum album L.	

Other than these there are other trees in the campus. The list of the trees are given below:

Table 2: Various Types of Trees in College

**3.3 Flora of Vijaya Raje Govt. Girls PG College, Morar, Gwalior (MP)**

Common & Botanical Name	Number
1. कसोद / <i>Cassia siamea</i>	05
2. अमलतास / <i>Cassia fistula</i>	02
3. केला / <i>Musa paradisiacal</i>	02
4. सेमल/ <i>Bombax Ceiba</i>	02
5. कचनार/ <i>Dolichus lablab</i>	05
6. हरसीगनार / <i>Nyctanthus arbortistis</i>	03
7. आवला/ <i>Emblica officinalis</i>	09
8. बरगद / <i>Ficus bengalensis</i>	01
9. गूलर / <i>Ficus glomerulosa</i>	01
10. पीपल/ <i>Ficus religiosa</i>	02
11. सफे दा/ <i>Eucalyptus</i>	01
12. सायकस/ <i>cycas</i>	04
13. जामुन/ <i>Syzygium cumini</i>	03
14. नीम/ <i>Azadirachta indica</i>	14
15. आम / <i>Mangifera indica</i>	03
16. शेहतूत/ <i>Mulberry</i>	03
17. गुडहल/ <i>Hibiscus rosa sinesis</i> (red, white, yellow orange variety)	17
18. सीताफल/ <i>Annora squamosa</i>	02
19. इक्सोरा/ <i>Ixora coccinea</i>	03
20. सप्तपर्णी/ <i>Alstonia scholaris</i>	05
21. नीम्बू/ <i>citrus lemon</i>	03
22. पलाश/ <i>Butea monosperma</i>	01
23. अश्वगंधा/ <i>Withania somnifera</i>	03
24. थूजा/ <i>Thuja occidentalis</i>	10
25. बेलपत्र/ <i>Aegle marmelos</i>	03
26. चंपा/ <i>Plumeria alba</i>	05



27. चमेली/ <i>Jasminum officinale</i>		08
28. गेंदा/ <i>Tagetes erecta</i>		05
29. गुलाब/ <i>Rosa rubiginosa</i>		30-50
30. आक/ अकु आ/ <i>Calotropis procera</i>		20-25
31. पाम/ palm		13
32. मीठा नीम/ <i>Murraya koenigii</i>		03
33. अर्जुन / <i>Terminalia arjuna</i>		04
34. मधुमालती/ <i>Combretum indicum</i>		01
35. लेमन ग्रास/ <i>cymbopogon citrates</i>		02
36. पुदीना/ <i>Mentha piperita</i>		01
37. लघु खजूर/ <i>Zamia furfurarea</i>		01
38. क्रिसमस ट्री / <i>Araucaria columnaris</i>		01
39. शतावर/ <i>Asparagus racemosus</i>		25
40. कुमारजीव/ पुत्रजीव/ <i>Putranjiva roxburghii</i>		01
41. अशोका/ <i>Saraca asoca</i>		105
42. बोटल ब्रश प्लांट/		01
43. शीशम/ <i>Dalbergia sisso</i>		04
44. एलबेस्स/ <i>Albezzia leeback</i>		01
45. अनार/ <i>Punica granatum</i>		02
46. रबर प्लांट/ <i>Ficus elastica</i>		02
47. बरगद / <i>Ficus Benghalensis</i>		28
48. इमली/ <i>Tamarindus indica</i>		01
49. सागोन /टीक/सागवान/ <i>Tectona grandis</i>		02
50. चिरोल/ <i>Holoptelea integrifolia</i>		03
51. अमरुद/ <i>Psidium guajava</i>		12
52. गुलमोहर/ <i>Delonix regia</i>		03
53. मुसेंदा / <i>Mussaena philippica</i>		01
54. अरंडी /के स्टर आयल प्लांट / <i>Ricinus communis</i>		05
55. बेर/ <i>Ziziphus nummularia</i>		05
56. रतनजोत / <i>Jatropha curcus</i>		01
57. पुननुवा/ <i>Boerhavia diffusa</i>		25-30

Other than these trees the campus hosts a long list of shrubs, Grasses. Details of which are given in following tables respectively.

Table 3: List of Shrubs grass and bale

Sr. No.	Scientific Name	Varnacular Name	Family	Number
1	MurrayaPaniculata	Madhu Malti	Rutaceae	
2	Cestrum Nocturnum	Ratrani	Solanaceae	
3	Gardenia Jasminoides	Gandhraj	Rubiaceae	
4	Hibiscus Rosa Sinensis	Gudhal	Malvaceae	
5	Ficus retusa	Ficus retusa	Moraceae	
6	Melaleucabracteata	Golden Battelbrush	Myrataceae	
7	PlumeriaPudica	NaagChampa	Apocynaceae	
8	BouganvilleaSpectabilis	BoganBelia	Nuctaginaceae	

1. Details of various type of Grass in College Campus				
Sr. No.	Scientific Name	Varnacular Name	Family	
1	Achnatherumbrachychactum	Puna Grass	Poaceae	
2	Cynodondactylon	Selection grass	Poaceae	
2. Details of various type of Bael in College Campus				
Sr. No.	Scientific Name	Varnacular Name	Family	Number
1	Jasminum Sambac	Mogra Bael	Oleaceae	
2	Mandolia	Mandolia Bael		
TOTAL				

Table 4: List of Grass

#### Recommendations-

- Geo tagging of all trees should be done.
- Students should be assigned plants to take care for.
- Each and every tree should be well documented.





## GREEN PLANTATION IN THE CAMPUS



Figure 3: Main front garden of college





Figure 4: plant/ trees at garden of college



## GREEN PLANTATION IN THE CAMPUS







Figure 5: Trees at college Campus





Figure 6: Plantation activity at college Campus









Figure 7: Plantation activity with NCC cadets at college Campus

## CHAPTER: 4

### FAUNA DIVERSITY

#### 4.1 Introduction

Biodiversity is the part of the campus. A rich biodiversity not only provides the shelter to many species around the college but also take us closer to the nature and for a student it is very important to connect to nature at every level. Vijaya Raje Govt. Girls P.G. College Morar, Gwalior (M.P.) is home to many different species around the campus. It has a very rich biodiversity. It consist of the following different animals in the campus-

**a) Family Bufonidae**

- i. Common Toad (*Duttaphrynus Melanostictus*)

**b) Family Dicroglossidae**

- i. Common Bull Frog (*Hoplobatrachus Tigrinus*)
- ii. Common Skittering Frog (*Euphlyctis Cyanophlyctis*)
- iii. Burrowing Frog (*Sphaerotheca Braviceps*)

**c) Family Rhacophoridae**

- i. Common tree frog (*Polypedates maculatus*)

**d) Lizard Family**

- i. House wall lizard (*Hemidactylus flaviviridis*)
- ii. Common Bark Gecko (*Hemidactylus leschenaultii*)
- iii. Brahmini (*Lygosoma punctata*)
- iv. Many keeled grass skink (*Eutrophiscarinata*)
- v. Goh or Goyra or Monitor lizard (*Varanus bengalensis*)
- vi. Girgit or Garden lizard (*Calotes versicolor*)

**e) Reptiles Family**

- i Indian Rat Snake – (*Ptyas Mucosa*)
- ii Cobra – (*Serpentis*)
- iii Peacock – (*Phasianidae*)

**f) Birds in the Campus**

Various type of birds are also present in the campus. List of all the birds in the campus is given below:



Table 5: **List of all the Birds in the campus**



S. No.	Common name	Scientific name
1	Crow	Corvus Corax
2	Pigeon	Columbia livia
3	Myna	Acridotheres
4	Nightingale	Luscinia megarhynchos
5	Humming Bird	Trochilidae
6	Sparrow	Passeridae
7	Eagle	Accipitridae
8	Cuckoo	Cuculidae
9	Hawk	Accipitridae
10	Kite	Milvus migrans
11	Owl	Strigiformes
12	Dove	Columbidae




#### 4.2 Observations and Recommendations




- Biodiversity of the campus is very rich.
- Maximum possible animals should be identified.
- All the identified animals should be well documented.
- Students should be aware about the fauna diversity of the college.






#### 4.3 Details of fauna

1.	<p><b>Scientific Name:</b> – <i>Scolopendra sp.</i><b>Common Name:</b> - Centipede<b>Classification:</b></p> <p><b>Phylum-</b>Arthropoda  <b>Class-</b>Chilopoda  <b>Order-</b>Scolopendromorpha  <b>Genus-</b><i>Scolopendra</i></p>	
2.	<p><b>Scientific Name</b> – <i>Poeciloceris sp.</i>  <b>Common Name-</b> Grasshopper  <b>Classification –</b></p> <p><b>Phylum-</b> Arthropoda  <b>Class-</b> Insecta  <b>Order-</b> Orthoptera  <b>Genus-</b><i>Poeciloceris</i></p>	

3.	<p><b>Scientific Name:</b> – <i>Carausius sp.</i></p> <p><b>Common Name:</b> - Stick insect</p> <p><b>Classification:</b></p> <p><b>Phylum</b>-Arthropoda</p> <p><b>Class</b>- Insecta</p> <p><b>Order</b>- Plasmida</p> <p><b>Genus</b>-<i>Carausius</i></p>	
4.	<p><b>Scientific Name:</b> – <i>Forficula sp</i></p> <p><b>Common Name:</b> - Earwig</p> <p><b>Classification:</b></p> <p><b>Phylum</b>-Arthropoda</p> <p><b>Class</b>- Insecta</p> <p><b>Order</b>- Dermaptera</p> <p><b>Genus</b>-<i>Forficula</i></p>	
5.	<p><b>Scientific Name:</b> – <i>Mantis sp.</i></p> <p><b>Common Name:</b> -Praying Mantis</p> <p><b>Classification:</b></p> <p><b>Phylum</b>-Arthropoda</p> <p><b>Class</b>- Insecta</p> <p><b>Order</b>- Dictyptera</p> <p><b>Genus</b>-<i>Mantis</i></p>	





6.	<p><b>Scientific Name:</b> – <i>Periplaneta sp.</i></p> <p><b>Common Name:</b> - Cockroach</p> <p><b>Classification:</b></p> <p><b>Phylum-</b>Arthropoda</p> <p><b>Class-</b> Insecta</p> <p><b>Order-</b> Blattodea</p> <p><b>Genus-</b><i>Periplaneta</i></p>	
7.	<p><b>Scientific Name:</b> – <i>Tineanasp34</i></p> <p><b>Common Name:</b> - Cloth Moth</p> <p><b>Classification:</b></p> <p><b>Phylum-</b>Arthropoda</p> <p><b>Class-</b> Insecta</p> <p><b>Order-</b> Lepidoptera</p> <p><b>Genus-</b><i>Tinea</i></p>	
8.	<p><b>Scientific Name:</b> – <i>Papilio</i> .<b>Common Name:</b> - Butterfly</p> <p><b>Classification:</b></p> <p><b>Phylum-</b>Arthropoda</p> <p><b>Class-</b> Insecta</p> <p><b>Order-</b> Lepidoptera</p> <p><b>Genus-</b><i>Papilio</i></p>	



9.	<p><b>Scientific Name:</b> <i>Helix</i> sp.</p> <p><b>Common Name:</b> -Gardensnail</p> <p><b>Classification:</b></p> <p><b>Phylum-</b> Mollusca</p> <p><b>Class-</b> Gastropoda</p> <p><b>Order-</b> Stylommatophora</p> <p><b>Genus-</b> <i>Helix</i></p>	
10.	<p><b>Scientific Name:</b> – <i>35an asp.</i></p> <p><b>Common Name:</b> - Frog</p> <p><b>Classification:</b></p> <p><b>Phylum-</b> Chordata</p> <p><b>Class-</b> Amphibia</p> <p><b>Order-</b> Anura</p> <p><b>Genus-</b> <i>Rana</i></p>	
11.	<p><b>Scientific Name:</b> – <i>Calotes</i> sp.</p> <p><b>Common Name:</b> -Bloodsucker</p> <p><b>Classification:</b></p> <p><b>Phylum-</b> Chordata</p> <p><b>Class-</b> Reptilia</p> <p><b>Order-</b> Lepidoptera</p> <p><b>Genus-</b> <i>Calotes</i></p>	

12.	<p><b>ScientificName:</b>–<i>Hemidactylus</i>sp.</p> <p><b>Common Name:</b> - Wall lizard</p> <p><b>Classification:</b></p> <p><b>Phylum-</b> Chordata</p> <p><b>Class-</b> Reptilia</p> <p><b>Order-</b> Lepidoptera</p> <p><b>Genus-</b><i>Hemidactylus</i></p>	
13.	<p><b>Scientific Name:</b> – <i>Passer</i> sp.</p> <p><b>CommonName:</b>-HousesparroworGauriya</p> <p><b>Classification:</b></p> <p><b>Phylum-</b>Chordata</p> <p><b>Class-</b>Aves</p> <p><b>Order-</b>Passeriformes</p> <p><b>Genus-</b><i>Passer</i></p>	
14.	<p><b>Scientific Name:</b> – <i>Columba</i> sp.</p> <p><b>CommonName:</b>-BluerockpigeonorKabutar</p> <p><b>Classification:</b></p> <p><b>Phylum-</b>Chordata</p> <p><b>Class-</b>Aves</p> <p><b>Order-</b>Columbiformes</p> <p><b>Genus-</b><i>Columba</i></p>	
15.	<p><b>Scientific Name:</b> – <i>Psittacula</i> sp.</p> <p><b>Common Name:</b> - Hiramantota</p> <p><b>Classification:</b></p> <p><b>Phylum-</b>Chordata</p> <p><b>Class-</b>Aves</p> <p><b>Order-</b>Psittaciformes</p> <p><b>Genus-</b><i>Psittacula</i></p>	



16.	<p><b>Scientific Name:</b> . Corvus sp</p> <p><b>Common Name:</b> Crow or Kag</p> <p><b>Classification:</b></p> <p><b>Phylum-</b>Chordata</p> <p><b>Class-</b>Aves</p> <p><b>Order-</b>Passeriformes</p> <p><b>Genus-</b><i>Corvus</i></p>	
17.	<p><b>Scientific Name:</b> – Pteropus sp.</p> <p><b>Common Name:</b> - Fruit bat or Chamgadar</p> <p><b>Classification:</b></p> <p><b>Phylum-</b> Chordata</p> <p><b>Class-</b> Mammalia</p> <p><b>Order-</b>Chiroptera</p> <p><b>Genus-</b>Pteropus</p>	
18.	<p><b>Scientific Name:</b> – Funambulus sp.</p> <p><b>Common Name:</b> - Gilhary</p> <p><b>Classification:</b></p> <p><b>Phylum-</b> Chordata</p> <p><b>Class-</b> Mammalia</p> <p><b>Order-</b> Rodentia</p> <p><b>Genus-</b>Funambulus</p>	
19.	<p><b>Scientific Name:</b> – Rattus sp.</p> <p><b>Common Name:</b> - Black rat</p> <p><b>Classification:</b></p> <p><b>Phylum-</b> Chordata</p> <p><b>Class-</b> Mammalia</p> <p><b>Order-</b> Rodentia</p> <p><b>Genus-</b>Rattus</p>	

20	<p><b>Scientific Name: – Pavo cristatus</b></p> <p><b>Common Name: - Indian peacock,</b></p> <p><b>Classification:</b></p> <p><b>Phylum- Chordata</b></p> <p><b>Class- Reptile</b></p> <p><b>Order- Landfowl</b></p> <p><b>Genus- Pavo</b></p>	
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Table 6: **List of all the Fauna in the campus**



## CHAPTER: 5

# GREEN ENERGY UTILISATION

Green Energy Audit is an effective means of establishment present efficiency levels and identifying Potential areas of improvement in energy consumption.

Green Energy audit of utility systems largely helps, which are given below:

Reducing the energy consumption with resultant reduction in electricity bills.

Audit involves data collection, data verification and detailed analysis of the data.

The analysis is leads to recommendations, which are short term(with minimum investment), medium term (with moderate investment) and long term (with capital expenditure).

The cost benefit analysis of various energy conservation proposals enables managements to take decisions regarding implementation schedules.

Here we are concerned about alternate energy as well as present use of energy.

**We appreciate the use solar power plant 30Kw in the college campus to meet out energy requirement**

### 5.1Data/Fact

Alternate Energy initiatives such as:

Power requirement of the Institution met by the renewable energy

### 5.2 Recommendation

Power by renewable energy sources must be More added in campus.

LED lights should be used at all places.

BLDC Fans should be used instead of conventional ones.

All pump should be five star rated by BEE

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





# Energy audit Certificate



**SABS ENERGY ENVIRO PVT. LTD.**

Registered In Bureau of Energy Efficiency (BEE) Under Ministry of Power GOI

Ref.No./SABS/EAC/2023-24/10,

Date:01.05.2023

## Certificate

This is to certify that **Vijayraje Govt. Girls PG College Murar , Gwalior (M.P.)**, which has conducted Detailed Energy Audit in FY 2022 - 2023 to assess the Electrical equipment's energy consumption and Green initiative activities in college premises.

SABS Energy, Auditor team has successfully completed Detailed Energy Audit , which is aimed to analyze Energy efficiency ,energy consumption and energy conservation initiatives in College premises.

**Mr. Sanjay Singh**

Certified Energy Auditor, BEE, GOI

EA -1462



E MAIL: [sabsind@yahoo.co.in](mailto:sabsind@yahoo.co.in), [info@sabsindia.com](mailto:info@sabsindia.com), [www.sabsindia.com](http://www.sabsindia.com)

**Save Energy save Nation, We Build A Solid Foundation For Saving Energy**



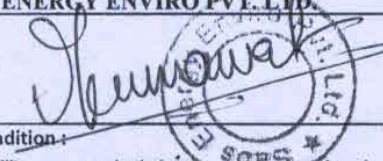
**SABS ENERGY ENVIRO PVT.  
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Works: 90/2 Abhinav Nagar Chitawad Ring Road, TinEmali, Indore


Mob. # 98260-12991, 8236088801 E-mail: [sabsind@yahoo.co.in](mailto:sabsind@yahoo.co.in), [sabsindia2018@gmail.com](mailto:sabsindia2018@gmail.com).

# Energy Audit Voucher

113

TAX - INVOICE					
<b>SABS ENERGY ENVIRO PVT. LTD.</b> 90/2 ABHINAV NAGAR, CHITWAD, INDORE (M.P.)-452001 PH.: 0731-2477960, 2 M.: +91-8236088801 EMAIL : SABSIND@YAHOO.CO.IN GSTIN NO. : 23ABDCS0344N1ZD			Invoice No.: SEEPL/23-24/03 Date : 09.05.2023 W. No. : 1504/Est./2023 W.O.Date : 25.01.2023		
<b>CONSIGNEE</b> To, The Principal Vijayaraje Govt. Girls PG College Murar Gwalior M.P, Pin 474011 GST :			<b>Work Site</b> Gwalior		
S. No	Description of item	Unit	Qty	Rate(Rs.)	Amount(Rs.)
1	Energy Audit in College Premises HSN Code: 9983	Job	1	25000.00	25000.00
				Total Amount	25000.00
				SGST @9%	2250.00
				CGST @9%	2250.00
				Total Amount	29500.00
For SABS ENERGY ENVIRO PVT LTD.					
					
<b>Terms &amp; Condition :</b> 1. our responsibility cese over absolutly as soon as the goods have been handed over to the carriers, 2. In case of shortage of goods ,it should be notified immdially on receipt of goods ( with short delivery certificate obtain from carriers ,3.Goods once sals will not be taken back ,4. Applicable sales tax /CST ,Declaration forms should be submitted within in 30 days from the date there of .else additional Tax in lliu of formas per rules with panelty if any imposed by sales tax authority should be borne by you.5. payment should be made by DD/ cheque payable in favour of SABS ENERGY ENVIRO PVT LTD.6. For overdues payment interest @24%					
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**PRINCIPAL**  
 Vijaya Rajee Govt. Girls P. G. College  
 Morar, Gwalior

  
**IQAC CO-ORDINATOR**  
 Vijaya Rajee Govt Girls PG Collene  
 Morar-Gwl





**SABS ENERGY ENVIRO PVT. LTD.**

Registered In Bureau of Energy Efficiency (BEE) Under Ministry of Power GOI

REF.: SEEPL/EEA/P-13  
DATE: 01.05.2023

TO,  
The Principal  
Vijayraje Govt. Girls PG College Murar  
Gwalior (M.P.)

Ref Order no : 1504/est./2023 dated 25.01.2023  
SUB. : For Energy Audit In College Premises

Sir/ Madam,

This is in reference to your work order for energy Audit of in College premises.

Please find attached

1. Original energy audit certificate
2. Copy of bill /invoice
3. Energy Audit report

Thanking you,  
Yours' faithfully,  
For SABS ENERGY ENVIRON PVT LTD

Authorised Signatory  
Sanjay Singh



PRINCIPAL  
Vijaya Raje Govt. Girls P. G. College  
Morar. Gwalior

**SABS ENERGY ENVIRO PVT.  
LTD.WWW.SABSINDIA.COM**

CO-ORDINATOR  
Vijaya Raje Govt Girls PG College  
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Mob. # 98260-12991, 8236088801 E-mail: sabsind@yahoo.co.in, sabsindia2018@gmail.com.

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# ENERGY AUDIT REPORT

YEAR 2022-23



**VIJYARAJE GOVT. GIRLS COLLEGE MORAR, DISTT.  
GWALIOR (M.P.)**  
**CONDUCTED BY:**



**SABS ENERGY ENVIRO PVT.LTD**

(Empaneled with Madhya Pradesh Urja Vikas Nigam Ltd. – A Govt. Undertaking)

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

**90/2 Abhinav Nagar, Teen Imali Square, Behind Vishesh  
Jupiter Hospital, Indore, Madhya Pradesh -452001 India**

**Email Address: [sabsind@yahoo.co.in](mailto:sabsind@yahoo.co.in) , [info@sabsindia.com](mailto:info@sabsindia.com)**

**Contact number: 8236088801, 9826012991**



THE ENERGY AUDIT DOCUMENT VERIFICATION TEAM		
External Audit Team		
Sr. No.	Name	Position
1	Mr. Sanjay Singh	BEE, Certified Energy Auditor, EA-1462
2	Mr. Rambabu Raghuvanshi	Lead Auditor and Energy Consultant
3	Mr. Shravan Yadav	Energy Consultant
4	Mr. Vinod Kumar Kumawat	Energy Consultant

## ACKNOWLEDGEMENT

**SABS ENERGY ENVIRO PVT. LTD.** is thankful to for their positive support in undertaking this intricate task of energy 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 field study of this audit was carried out on 30 January 2023.

The officials of **VIJYARAJE GOVT. GIRLS COLLEGE MORAR, GWALIOR (M.P.)** coordinated and helped the audit team during the field study and assessment. **SABS ENERGY ENVIRO PVT. LTD.** expresses special thanks to the following persons of **VIJYARAJE GOVT. GIRLS COLLEGE MORAR, GWALIOR (M.P.)**

1	Principal	<b>Dr. Sushila Mahor</b>
2	IQAC In-charge	<b>Dr. S.K. Shrivastava</b>
3	Accountant	<b>Mr. Matacharan Sharma</b>
4	Prof.- Economics	<b>Dr. K. K. Shrivastava</b>
5	Prof. –English	<b>Mr. N.S. Niranjana</b>
6	Prof. – Physics	<b>Mr. R.K. Dandoliya</b>

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.

**SABS ENERGY ENVIRO PVT LTD**

**MR. SANJAY SINGH**  
**EA-1462**  
**Certified Energy Auditor**  
**M. Tech (Energy Management)**



## List of Contents

Sr. No.	Topic	Page No.
1	Chapter-1 About the College	10
2	Chapter-2 Site Visit and Inspection	11-12
3	Chapter-3 Energy Audit Introduction	13-14
4	Chapter-4 Electricity Bill analysis	15-17
5	Chapter-5 Lighting System	18-20
6	Chapter-6 Fan System	21-22
7	Chapter-7 Other Equipment's Load	23
8	Chapter-8 Pumping System	24
9	ANNEXURE - I	31
10	ANNEXURE - II	32

*Figure 1: Electricity Connected Load details of campus in different Zone*

*Figure 2: Vijayaraje Govt. Girls College Morar, Gwalior,*

*Figure 3: Vijayaraje Govt. Girls College Morar, Gwalior, Lux Measurement*

*Figure 4: Vijayaraje Govt. Girls College Morar, Gwalior, PV Solar System*

## EXECUTIVE SUMMARY

### College Details:

Particulars	Units	Details
Name of the College	-	<b>VIJYARAJE GOVT. GIRLS COLLEGE MORAR, GWALIOR (M.P.),</b>
Location	-	Morar, Distt. Gwalior (M.P), India
Owner	-	Government
Contact Person	-	Dr. S.K. Shrivastava
No. of Shifts	Nos.	1
Daily Operating Hours	Hrs./day	8
Annual Working Days	Days/yr.	300
Source of Electricity	-	MPPKVVCL
Total connected maximum Load	kW	98
Total Sanctioned Load	(kW)	110
Average Energy Charge in perunit	Rs./kWh	10.17



a) Existing Major Energy Consuming Technology and Electricity billing analysis:

The major equipment installed VIJYARAJE GOVT. GIRLS COLLEGE MORAR, GWALIOR (M.P.), like Lighting fixtures, Fans and other appliances.

1. Table 1: Connected Load (kW)

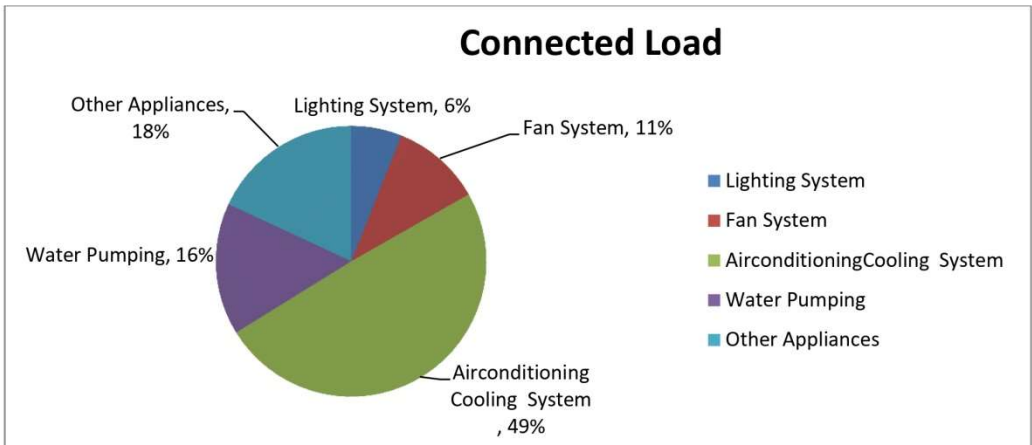


Figure 1: Electricity Connected Load details of campus in different zone

- As per electricity bills observation and analysis, Total Sanction load is 110 kW in College premises.
- As per electricity bills observation and analysis, **electricity bill Power Factor varies 0.96 to 0.99.**
- We observed that maximum load of Air Condition & Exhaust fan etc.
- College using day light in very efficiently.

b) Proposed Energy Saving Technologies with Cost Economics

❖ Lighting System

- We **suggest using LED Lighting luminaries** at some location as per site visit.
- We **are suggesting to purchase all electrical** equipment as per star leveling program by Bureau of energy efficiency, which will get huge amount of electricity saving.

En

- We are suggesting conducting regular **Cleaning and maintenance of lighting fixtures** in every 5-6 months to increase performance of Lighting and also improve their Lux level.
- As per data collection and site visit, Total Connected lighting load at College Campus is **5.12 kW**.
- As per data collection and observation, **Total no. of lighting fixture is 175**.

#### ❖ *Ceiling and Exhaust Fan System*

- We are **suggesting to purchase new energy efficient BLDC fan as per Star leveling program by Bureau of Energy Efficiency, which will get** huge amount of electricity saving.
- Energy Saving calculation **and recommendation for the existing Conventional** Ceiling fans with BLDC super energy efficient fan has been given in this report.
- We are suggesting **conducting regular Cleaning and maintenance** of Fans at least in every 6 months to increase performance of Fan.
- We are also suggesting improving the Air delivery of Fans by replacing the existing ones with new energy efficient BLDC Fans as per 5 stars leveling of Bureau of energy efficiency.
- The total load for Ceiling and exhaust Fan is **10.50 kW**.
- Total No. of Fan fixtures are **167**.

#### ❖ *Pumping System*

- We observed during Energy Audit and site visit, **2 Pump of Capacity 5 & 3 HP within** College campus for drinking water, Flushing and gardening purpose.
- Power consumption of both pump was **15.44 kW as** per site visit and measurement.
- We are suggesting purchasing **5 star rated pumps which will get huge** amount of saving as per Star leveling program by Bureau of Energy Efficiency 2020.
- We are **suggesting installing Solar Pumping system which** will get huge amount of savings.



❖ *Other Different Type of Connected Load:*

There are different types of other equipment like Computer, Printer, Xerox machine, Water Cooler, Refrigerator and other lab equipment installed at various locations and they also contribute to electricity consumption.

- Total Connected load **97.97 kW** and Total **412 no.** equipment installed.
- Light load **5.92 kW and 175 no.** of lighting fixtures.
- Fan load **10.53 kW and 167 no.** of fixtures.
- We suggest to **purchase equipment as per Star leveling program** by Bureau of Energy Efficiency 2020 which will get huge amount of electricity saving.
- Maintenance of all the equipment should be done regularly.

## CHAPTER-01

### INTRODUCTION OF THE COLLEGE

#### 1.1 Introduction

**Vijayaraje Govt. Girls Post Graduate College, Morar**, is situated in Gwalior Madhya Pradesh of College is established in the year of 1963, it is a multi-faculty College having Arts and Humanities, Science, Home Science and Commerce faculties. It has also started B.Sc Computer science and B.Com. with Computer Applications, B.Sc. (Chemistry), M.Com. and M.A. (English) under self-financing scheme. The College has on its rolls 5,169 students. No. of Surviving Teaching Faculty are 50. The College is affiliated to JIWAJI UNIVERSITY, Gwalior registered under 2(f) and 12(b) with the UGC.

The Vision and Mission of **Vijayaraje Govt. Girls Post Graduate College, Morar**, Gwalior (M.P.) are as under:

#### **VISION:**

- To empower women with excellent education, inclusiveness, empathy, self-reliance and respect for Indian culture.

#### **MISSION:**

- To provide quality education with traditional values for the holistic development of women especially from weaker section of society.
- To nature human skills and augment national consciousness.
- To prepare them to face the challenges of modern, technological and globalizing world.
- To sensitize them with social and environmental issues.



## CHAPTER-02

### SITE VISIT AND INSPECTION

#### 2.1 Site visit and site inspection

Energy audit team visited **Vijayaraje Govt. Girls Post Graduate College, Morar**, premises and completed electrical measurement and appliances data collection.



*Figure 2: Vijayaraje Govt. Girls College Morar, Gwalior, Site Visit*



*Figure 3: Vijayaraje Govt. Girls College Morar, Gwalior, Lux Measurement*

## CHAPTER-03

### ENERGY AUDIT

#### 3.1 Introduction of Energy Audit

Energy Audit is an effective means of establishment present efficiency levels and identifying Potential areas of improvement in energy consumption.

Energy audit of utility systems largely helps in the areas which are given below:

Reducing the energy consumption with resultant reduction in electricity bills.

Audit involves data collection, data verification and detailed analysis of the data.

The analysis leads to recommendations, which are short term (with minimum investment), medium term (with moderate investment) and long term (with capital expenditure).

The cost benefit analysis of various energy conservation proposals enables managements to take decisions regarding implementation schedules.

Energy conservation is a worldwide objective to save human beings from possible disaster. Under the mandate of The Energy Conservation Act 2001, the Bureau of Energy Efficiency and Government of India is implementing various programmes to provide momentum to the energy conservation movement in the country. Energy Auditing is most vital part of the conservation of energy. In order to improve the efficiency of the Energy consuming system, energy auditing is the first necessary action to be taken by the concerned firm. Through the energy auditing actual parameters can be detected at each step, which can be compared with the standard achievable parameters. For proper Energy auditing and energy accounting, parameters need to be monitored on regular basis.

#### 3.2 Methodology & Approach

The audit involved basic design data collection for various electrical & thermal utilities, meetings with concerned departmental engineers & managers carrying out various field measurements, performance analysis and loss analysis covering all major energy consuming sections of **Vijayaraje Govt. Girls Post Graduate College, Morar, Gwalior** to realistically assess losses mainly in energy consuming utility areas and potential for energy savings. The major areas of study include:



- Building electricity bills analysis.
- Electrical supply and distribution system analysis
- Lighting system analysis.
- Water pumping system analysis.
- Buildings envelop analysis.
- Specific Energy Consumption.

During study several interactions were made with the office personnel and technicians to share the actual operational features of equipment, maintenance of equipment breakdown, time of machineries, safety measures etc. At the same time required data was collected from various departments and reviewed the same with the operational actual data.

The study focused on improving energy use efficiency and identifying energy saving opportunities for various equipment. The analyses included simple payback period and life cycle cost calculations where investments are required to be made to implement recommendations, to establish their economic viability.

### 3.3 Instruments used in Energy Audit

We have a wide array of latest, sophisticated, portable, diagnostic and measuring instruments to support our energy audit investigations and analyses. The audit study made use of various portable instruments along with plant online instrumentations, for carrying out various measurements and analyses. The specialized instruments that were used during the energy audit include:

- Power Analyzer.
- Ultra-Sonic Flow Meter.
- Digital power clamp meter & multi-meter (2745 KUSAM MECO)
- Digital Hygrometer HD-304 HTC
- Digital Lux Meter (LX-101A HTC TM)
- Digital Anemometer (AVM -07 HTC)
- IR Thermometers for temperature measurement HTC TM (IR -50 to 1550 0C)
- Digital distance meter
- Measuring Tap meter

## CHAPTER-04

### ELECTRICITY BILL ANALYSIS

#### 4.1 Month Wise Energy Consumption

**Vijayaraje Govt. Girls Post Graduate College, Morar,** Receives power from, Madhya Pradesh Paschim Kshetra Vidyut Vitran Company Limited Indore.

The maximum demand, energy consumption, fixed charges, energy charges and total bill in Rs. 85737/- for the financial year 2022-2023 are shown in below tables as per the details from the College bill. One year's data have been represented by various graphs. These indicators address energy consumption, energy sources, energy monitoring, and electricity consumption.

#### **Tariff Schedule LV - 2**

##### **NON-DOMESTIC:**

##### **LV 2.1**

##### **Applicability:**

This tariff is applicable for light, fan and power to Schools / Educational Institutions including workshops and laboratories of Engineering Colleges / Polytechnics/ITIs (which are registered with /affiliated/ recognized by the relevant Govt. body or university), Hostels for students or working women or sports persons.

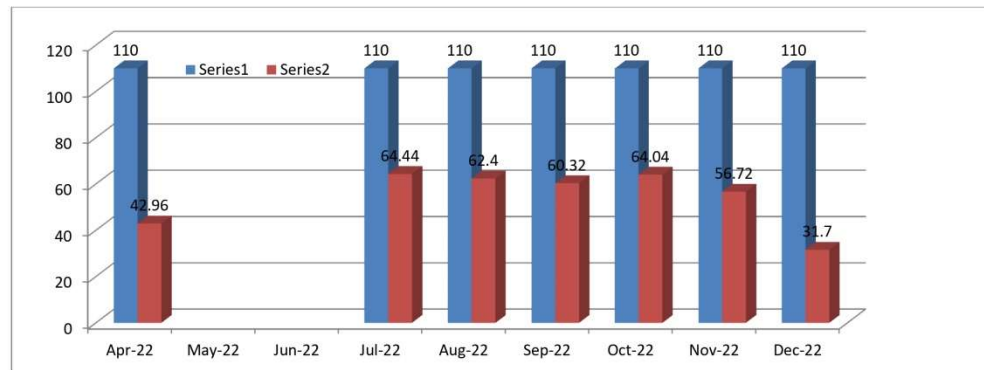
##### **Tariff:**

Tariff shall be as given in the following table:

Sub category	Energy Charge (paise/unit) Urban/ Rural areas	Monthly Fixed Charge (Rs.)	
		Urban areas	Rural areas
Sanctioned load-based tariff (only for connected load up to 10 kW)	630	150 per kW	120 per kW
Demand based tariff <b>Mandatory</b> for Connected load above 10 kW	630	270 per kW or 216 per kVA of billing demand	230 per kW or 184 per kVA of billing demand

Table 2: Electricity bill analysis

Monthly Electrical bill detail in Vijayaraje Govt. Girls College Morar								
IVRS No. N3131021738, Address Garam Sadak								
Months	Sanctioned Load (KW)	MDI	kWh	Fixed charges (Rs)	Energy Charges (Rs)	Power Factor	Total bill (Rs)	Average Per unit Charges Rs/KWh
Apr-22	110	42.96	8263	14850	53458	0.93	278282	33.68
Jul-22	110	64.44	12839	17600	84244	0.96	96652	7.53
Aug-22	110	62.4	13009	17050	85862	0.96	97435	7.49
Sep-22	110	60.32	11439	16500	75498	0.96	88118	7.70
Oct-22	110	64.04	12190	17600	80495	0.97	91231	7.48
Nov-22	110	56.72	9880	15675	66193	0.98	77252	7.82
Dec-22	110	31.7	8240	14850	55210	0.98	66133	8.03
			75860	Total Bill			795103	10.48



Page 16

Energy Audit Report Vijayaraje Government Girls College Morar, Distt. Gwalior M.P

**OBSERVATIONS & COMMENTS:**

- As per electricity bills observation and analysis, **Total Sanction load is 110 kW** in 2022 College premises.
- As per electricity bills observation and analysis, **electricity bill Power Factor varies from 0.96 to 0.99**
- It is observed that maximum demand varies **0 to 110 kVA**.
- It is observed that Average Per unit Charges **10.48 Rs/kW**.

Page 17

Energy Audit Report Vijayaraje Government Girls College Morar, Distt. Gwalior M.P



## CHAPTER-05

### LIGHTING SYSTEM

#### 5.1 Details of Lighting System

**Vijayaraje Govt. Girls Post Graduate College, Morar,** Has high lighting load and various type of indoor and outdoor lighting fixtures are installed in college campus. Lux measurement was also done at the time of audit. All the parameters are given in the below table:

*Table: 4 Indoor Lighting details*

Sr. No.	Location	Types of Lighting	No.of Lighting fixture	Power (W)	Total Power (W)	Lux Level
	Chemistry Lab.	LED T.L.	2	28	56	198-232
		T.L	2	40	80	40-80
	Room	LED T.L.	3	40	120	110-160
	Room	LED T.L.	5	28	140	55-95
	Room Botany	LED T.L.	2	40	80	116-156
	Room	LED T.L.	2	20	40	50-80
	Micro Biology Lab.	T5	3	28	84	35-55
		T5	4	28	112	15-40
		T5	3	20	60	35
	Room No. 21	LED. T.L.	4	40	160	110-125
	Room No. 22	LED T.L.	4	40	160	110-125
	Room No. 23	LED T.L.	4	40	160	110-125
	Room No. 24	LED T.L.	4	40	160	210-240
	Biotec Room Lab -2	LED T.L.	4	40	160	140-160
		T5	1	28	28	40-60
	Home Science	LED T.L.	7	28	196	70-95
	Textile	LED	1	20	20	170-200
	Nutrituion Lab.	LED	7	28	196	120-150
	Biotec Lab -2	LED	4	40	160	60-80
	Library	LED	1	20	20	60-80
		LED	2	40	80	60-85
		LED	3	20	60	60-85
		LED	3	28	84	150-175
		LED	3	20	60	180-200
	English	LED	3	28	84	80-120
	Sociology	LED	2	28	56	25-40

Sr. No.	Location	Types of Lighting	No.of Lighting fixture	Power (W)	Total Power (W)	Lux Level
		LED	2	20	40	180-250
	E-Library	LED	6	28	168	160-280
	Semester Cell	LED	3	28	84	60-190
	Room No. 11	LED	4	28	112	150-200
	Room No. 12	LED	4	28	112	130-150
	Room No. 13	LED	4	28	112	130-160
First Floor	Room No .15	LED	4	40	160	170
	Room No. 16	LED	4	40	160	180
	Room No. 17	LED	4	40	160	190
	Community Hall	LED	16	40	640	190
	Double Story Building	LED	6	40	240	150
	Remaining Building	LED	5	40	200	70-95
		LED	5	40	200	55-85
		LED	4	40	160	100-115
		LED	2	28	56	90-115
		LED	4	40	160	140-180
	Office	LED	3	28	84	150-180
		LED	6	40	240	120-140
		LED	2	28	56	110-150
		LED	4	40	160	100-130
<b>Total Power Consumption in kW</b>					5920	
<b>Total no. of Lighting Fixture</b>			<b>175</b>			

## Outdoor lighting:

Table: 5 Outdoor Lighting details

VIJAYARAJE GOVT. GIRLS COLLEGE MORAR, GWALIOR (M.P.)						
	Location	Location of Fixtures	Types of light	No.of Lighting fixture	Power (Watts)	Total Power (Watts)
1	Out Door Lighting	Street Light	LED	6	50	300
			LED	8	50	400
			LED	12	50	600
Total Power Consumption in kW			1.3			
Total no. of Lighting Fixture			14			

## OBSERVATIONS & COMMENTS

- We are appreciating that your replaced FTL with Energy Efficient LED Tube light.
- We recommend **using LED Lighting luminaries at some locations as per site visit.**
- We **are suggesting to purchase all electrical** equipment as per star leveling program by Bureau of energy efficiency, which will get huge amount of electricity saving.
- We are suggesting conducting regular **Cleaning and maintenance of lighting fixtures** in every 5-6 months to increase performance of Lighting and also improve their Lux level.
- As per data collection and site visit, Total Connected **indoor lighting load** at College Campus is **5.92 kW.**
- As per data collection and site visit, Total Connected **outdoor lighting load** at College Campus is **0.13 kW.**
- As per data collection and observation, **Total no. of Indoor lighting fixture is 175.**
- As per data collection and observation, **Total no. of Outdoor lighting fixture is 14.**



## CHAPTER-06

### FAN SYSTEM

There are various ceiling fans installed at various locations in **VIJAYARAJE GOVT. GIRLS COLLEGE MORAR, GWALIOR (M.P.)**. And they also contribute to very high electricity consumption. All of the fans are conventional and hence are high energy consuming.

*Table: 6 Details of Fan*

Sr. No.	Location	Types of Fan	No.of Fan	Power (W)	Total Power (W)
1 Ground Floor	Chem Lab.	Ceiling Fan	4	68	272
	Chem Room	Ceiling Fan	2	68	136
	Lab	Ceiling Fan	5	68	340
	Zoo Lab.	Ceiling Fan	2	68	136
	Micro Bio	Ceiling Fan	6	68	408
	Room No. 21	Ceiling Fan	12	68	816
	Room No. 22	Ceiling Fan	12	68	816
	Room No. 23	Ceiling Fan	12	68	816
	Room No. 24	Ceiling Fan	12	68	816
	Office	Ceiling Fan	3	55	165
First Floor	Home Sc.	Ceiling Fan	5	68	340
	Textile	Ceiling Fan	6	68	408
	Nutrition Lab.	Ceiling Fan	4	68	272
	Biotech	Ceiling Fan	10	68	680
	Comp. Lab.	Ceiling Fan	6	68	408
	Library	Ceiling Fan	8	68	544
	Art Block English	Ceiling Fan	3	68	204
	Sociology	Ceiling Fan	5	68	340
	E-Library	Ceiling Fan	6	68	408
	Semester Cell	Ceiling Fan	3	68	204
	Room No. 11	Ceiling Fan	4	55	220
	Room No. 12	Ceiling Fan	4	55	220
	Room No. 13	Ceiling Fan	4	55	220
	Room No. 15	Ceiling Fan	4	55	220
	Room No. 16	Ceiling Fan	4	55	220

Sr. No.	Location	Types of Fan	No.of Fan	Power (W)	Total Power (W)
	Room No. 17	Ceiling Fan	4	55	220
	Commerce Hall	Ceiling Fan	6	55	330
	Double Story Building	Ceiling Fan	6	55	330
		Ceiling Fan	5	40	200
<b>Total no. of Fixture</b>			<b>167</b>		<b>10.509</b>

## OBSERVATIONS & COMMENTS

- We recommend **to purchases new energy efficient BLDC fans as per Star leveling programby Bureau of Energy Efficiency, which will get** huge amount of electricity saving.
- Energy Saving calculation **and recommendation for the existing Conventional** Ceiling fans with BLDC super energy efficient fan have been given in this report.
- We are suggesting **conducting regular Cleaning and maintenance** of Fan at least in every 6months to increase performance of Fan.
- We are also suggesting improving the Air delivery of Fans by Replacing them with New energy efficient BLDCFan as per 5 stars leveling of Bureau of energy efficiency.
- The total load for Ceiling and exhaust Fan is **10.50 kW**
- Total No. of Fan fixtures are **167**.

## CHAPTER-07

### OTHER EQUIPMENTS LOAD

#### 7.1 Different Type Other Equipment

There are different types of other equipment like Printer, PC, Water Cooler, Refrigerator and other lab equipment installed at various locations in **VIJAYARAJE GOVT. GIRLS COLLEGE MORAR, GWALIOR (M.P.)**. and they also contribute to electricity consumption.

*Table 7: Different type of equipment system*

Other equipment location wise						
Sr. No.	Location	Location of Product	Type of Product	Number of Product	Power (Watts)	Total Power (Watts)
			PC	6	100	600
			Printer	6	650	3900
			Photocopier	4	1800	7200
			Projector	2	100	200
			Water Cooler	4	650	2600
			Microwave	1	900	900
		Control Room	Fridge	5	300	1500
			Washing Machine	2	400	800
Total Connected Load in kW			17.7			
Total no. of Connected Electrical Appliances			30			

#### OBSERVATION AND COMMENTS

- Total Connected load **17.7 kW** and Total **30 no.** equipment installed.
- We suggest to **purchase equipment as per Star leveling program recommended** by Bureau of Energy Efficiency 2020, which will result in huge amount of electricity saving.
- Maintenance of all the equipment should be done regularly.



## CHAPTER-08 PUMPING SYSTEM

### 8.1 Details of Pumps

There is 2 no. of 3 hp & 5hp capacity of submersible pump installed within college campus for drinking water, Flushing and gardening purpose.

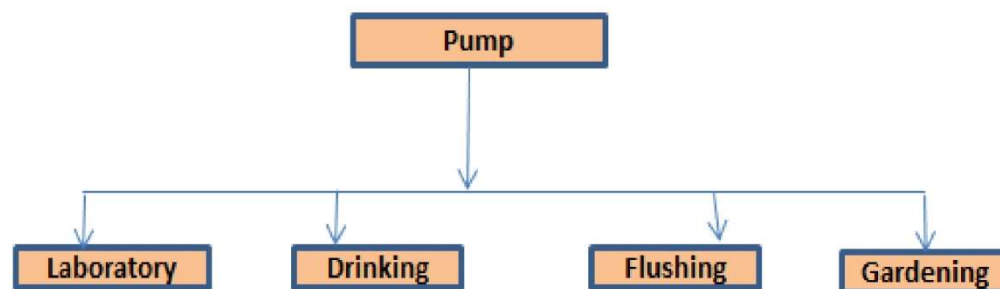


Table 8: Details of pumping system

JANNAYAK TANTYA MAMA GOVT. COLLEGE BHIKANGAON , KHARGAON (M.P.)					
Sr. No.	Location of Pump	Types of Pumps	No. of Pump	Power (HP)	Total Power (kW)
1	Outside & Near Ground	Submersible	2	7.5	15.45
<b>Total Power in kW</b>					15.45

#### OBSERVATION AND COMMENTS

- We observed during Energy Audit and site visit, **2 Pump of Capacity 7.5 hp within** Collegecampus for drinking water, Flushing and gardening purpose.
- Power consumption of 2 Nos. pumps was **15.45 kW as** per site visit and measurement.
- We are suggesting purchasing **5 star rated pumps which will result in huge** amount of saving as per Star leveling program of Bureau of Energy Efficiency 2020.
- We are **suggesting installing Solar Pumping system which** will result in huge amount of savings.

Energy Saving Activities Conducted by the College



Energy Saving Posters in Classrooms







## Conclusion

Vijayaraje Govt. Girls College Morar, is college serving for Higher Education for about thirty Five years. The electrical equipment is therefore quite old and since the bulk replacement of these involves PWD, Indore the institute has not actively engaged in the process of replacement. The activities involving students for energy conservation, signboards for energy conservation and participation of the students and teachers in the Energy Literacy Campaign of Govt. of Madhya Pradesh and receiving Usha Mitra Certificates are some of the genuine efforts on the part of the college for Energy conscious conservation measures. Their initiative of conducting an Energy Audit for attaining professional assessment and recommendations for energy saving is also commendable. The fulfillment of recommendations of this Audit partially or fully will surely move the institute a forward in the direction of energy conservation significantly.

**It is **advisable** to use electrical equipment with:**

- 1) We appreciate of use LED Lightings in new buildings & we also recommend replacing all FTL with Energy efficient LED lightings.**
- 2) We Strongly recommended to use of Solar Roof top On-grid Solar PV system in college premises to increase the use of green energy.**
- 3) We appreciate the campus having good natural day light in class room & good air ventilation also at upper floors in the buildings.**
- 4) We strongly recommended installing Solar Street light for Outdoor Light**
- 5) Recommended to use Energy Efficient BLDC Ceiling Fan for 50% energy saving.**
- 6) We appreciate the efforts of faculty & student; during the energy audit we found no wastage of energy in the campus.**
- 7) We also recommend using all 5 star rated Energy Efficient Products Lights, Fan, Pump, etc.**
- 8) We also recommended using solar pumping system for irrigation & water management in campus to reduce electrical bills.**
- 9) We recommend using install motion sensor based lighting in area of less activity / motion / movement.**
- 10) We also recommend using sign board of switch-off the electrical loads when not in use.**
- 11) We also recommend using air condition temperature setting to 24°C.**

# ANNEXURE – I

Activity	Illumination (lux, lumen/m <sup>2</sup> )
Public areas with dark surroundings	20 - 50
Simple orientation for short visits	50 - 100
Working areas where visual tasks are only occasionally performed	100 - 150
Warehouses, Homes, Theaters, Archives	150
Easy Office Work, Classes	250
Normal Office Work, PC Work, Study Library, Groceries, Show Rooms, Laboratories	500
Supermarkets, Mechanical Workshops, Office Landscapes	750
Normal Drawing Work, Detailed Mechanical Workshops, Operation Theatres	1,000
Detailed Drawing Work, Very Detailed Mechanical Works	1500 - 2000
Performance of visual tasks of low contrast and very small size for prolonged periods of time	2000 - 5000
Performance of very prolonged and exacting visual tasks	5000 - 10000
Performance of very special visual tasks of extremely low contrast and small size	10000 - 20000



## ANNEXURE – II

### *Super Energy efficient BLDC Ceiling Fan*

	900 mm	1050 mm	1200 mm	1400 mm
<b>Warranty (Years)</b>	3 Years	3 Years	3 Years	3 Years
<b>Blade Span (mm/inch)</b>	900/36	1050/42	1200/48	1400/56
<b>RPM</b>	450	430	350	270
<b>Service Value</b>	7.1	6.6	7.8	7.7
<b>Input Voltage (V)</b>	140-285	140-285	140-285	140-285
<b>Power Consumption (W)</b>	28	32	28	35
<b>Frequency (Hz)</b>	48-52	48-52	48-52	48-52
<b>Air Delivery (CMM)</b>	200	210	220	270
<b>Power Factor</b>	>0.98	>0.98	>0.98	>0.99
<b>No. of Blades</b>	3	3	3	3
<b>Bearing (Double)</b>	Deep Groove Double Sided Steel Shielding			
<b>Remote Control (12 Keys)</b>	Speed Control, Boost Mode, Timer and Sleep Mode			



**Comparison Between Ordinary,5 Star Rated and Super-Efficient Fans**

Parameters	Ordinary Fan	5 Star Rated Fan	Super-Efficient Fan
Wattage	75	50	28
RPM (speed)	380	<b>330</b>	360-380
CMM (air delivery)	230	<b>210</b>	220-230
Power factor	>0.9	>0.95	>0.99
Regulator	Yes	Yes	Not Required (Remote controlled)
Input Voltage	230	230	140-285V
Warranty	1-2 year	1-2 year	3 years
MRP	1300-1600	1800-2500	3690



7-1-3  
(67)

## शासकीय कन्या महाविद्यालय मुरार में वृक्षारोपण किया







गवालियर। गांधी जयंती के अवसर पर और शासन के आदेशानुसार अंकुर प्रोग्राम के अंतर्गत आज विजयाराजे शासकीय कन्या स्नातकोत्तर महाविद्यालय, मुरार में राष्ट्रीय सेवा योजना की कार्यक्रम अधिकारी डॉ. मंजू सिंह वीर के द्वारा प्रभारी प्राचार्य डॉ. एस. के. श्रीवास्तव के संरक्षण में वृक्षारोपण कर वायुदूत एप्प पर अपडेट किया गया। कार्यक्रम का प्रारंभ गांधी जी की प्रतिमा पर माल्यार्पण एवं पुष्प अर्पित कर किया गया। इस कार्यक्रम में महाविद्यालय के वरिष्ठ प्राध्यापक डॉ. बीना गुप्ता, डॉ. अपर्णा शर्मा, डॉ. शुभा श्रीवास्तव, क्रीडा अधिकारी दीपा वर्मा आदि उपस्थित रही। बड़ी संख्या में एन.एस.एस., एन.सी.सी., और स्पोर्ट्स की छात्राएं उपस्थित रही। छात्राओं के द्वारा गांधी जी के प्रिय भजन वैष्णव जन तो तेने कहिये का गायन किया गया। प्राचार्य के द्वारा कार्यक्रम में उपस्थित सभी छात्राओं और कर्मचारियों को गांधी जी के आदर्शों पर चलने की शपथ दिलाई गई। अंत में कार्यक्रम अधिकारी मंजू सिंह वीर द्वारा सभी का धन्यवाद ज्ञापित कर आभार व्यक्त किया गया।

*[Signature]*  
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Morar, Gwalior

*[Signature]*  
**COORDINATOR**  
Vijaya Raje Govt Girls PG College  
Morar-Gwl



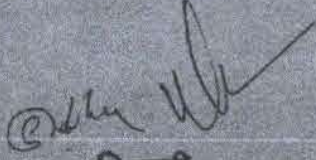
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NSS छात्राओं ने किया पौधरोपण




## छात्राओं ने पौधरोपण के साथ शुरू किया अभियान



शासकीय विजयाराजे कन्या स्नातकोत्तर महाविद्यालय मुरार की छात्राओं द्वारा गुरुवार को हरियाली महोत्सव का शुभारंभ किया गया। इस अवसर पर शिक्षकों ने पौधरोपण के लिए राजीव गांधी ग्रीन कॉरिडोर का चयन किया। कार्यक्रम में प्राचार्य डॉ. सुशीला माहौर, क्रीड़ा विभाग और एनसीसी की छात्राएं शामिल थीं।

  
कार्यक्रम अधिकारी  
राष्ट्रीय सेवा योजना  
शासकीय कन्या स्नातकोत्तर महाविद्यालय  
मुरार, बल्लभपुर (फरगाना)

  
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IQAC  
CO-ORDINATOR  
Vijaya Raje Govt. Girls PG College  
Morar-Gwl



## Photos of Plantation drive in the college campus



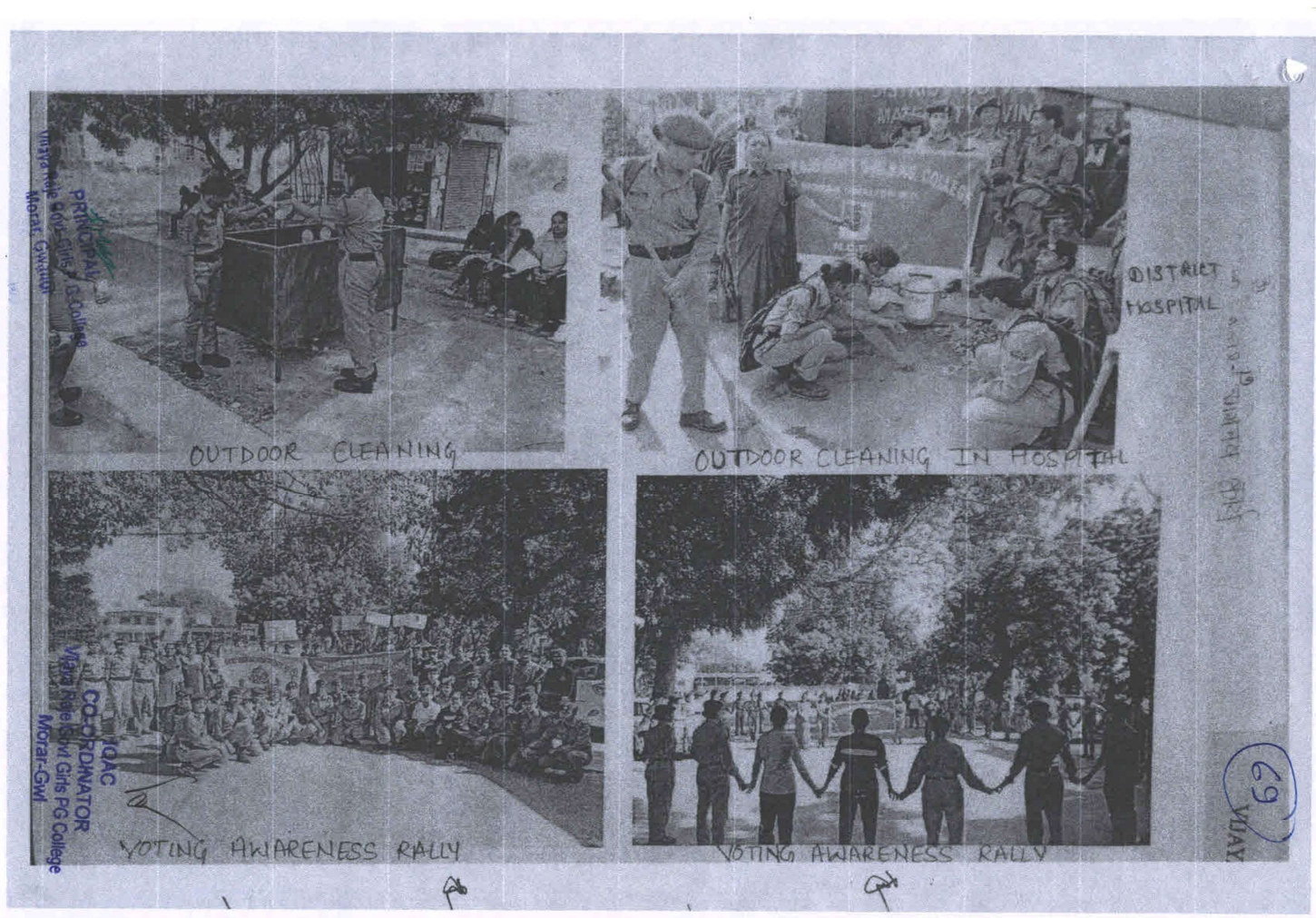


Photos of outdoor cleaning activity





## Photos of outdoor cleaning by students of the college



## Photos of voting awareness rally by staff members and students



। इस सबका समझन का जरूरत ह। माजूद रह।

## विजयाराजे शासकीय कन्या स्नातकोत्तर महाविद्यालय, मुरार मे चलाया गया स्वच्छता अभियान



द संघर्ष न्यूज ग्वालियर।  
राजेन्द्र झा, मोबा-9425717394

ग्वालियर। विजयाराजे शासकीय कन्या स्नातकोत्तर महाविद्यालय, मुरार मे स्वच्छता अभियान चलाया गया इस अवसर पर राष्ट्रीय सेवा योजना की स्वयंसेविकाओं द्वारा महाविद्यालय परिसर की सफाई कर कार्यक्रम को सफल

बनाया गया। कार्यक्रम में महाविद्यालय की प्राचार्य डॉ. सुशीला माहौर, रासेयो कार्यक्रम अधिकारी डॉ. मंजू सिंह वीर, डॉ. मौसमी सिंह, रासेयो सहायक कार्यक्रम अधिकारी डॉ. कपिला पांचाल, प्रो. ममता चौहान, शिवानी साहू, क्रीड़ा अधिकारी श्रीमती दीपा वर्मा, वरिष्ठ प्राध्यापकगण, कर्मचारी एवं रासेयो स्वयंसेवक उपस्थित रहे।

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# स्वच्छता अभियान



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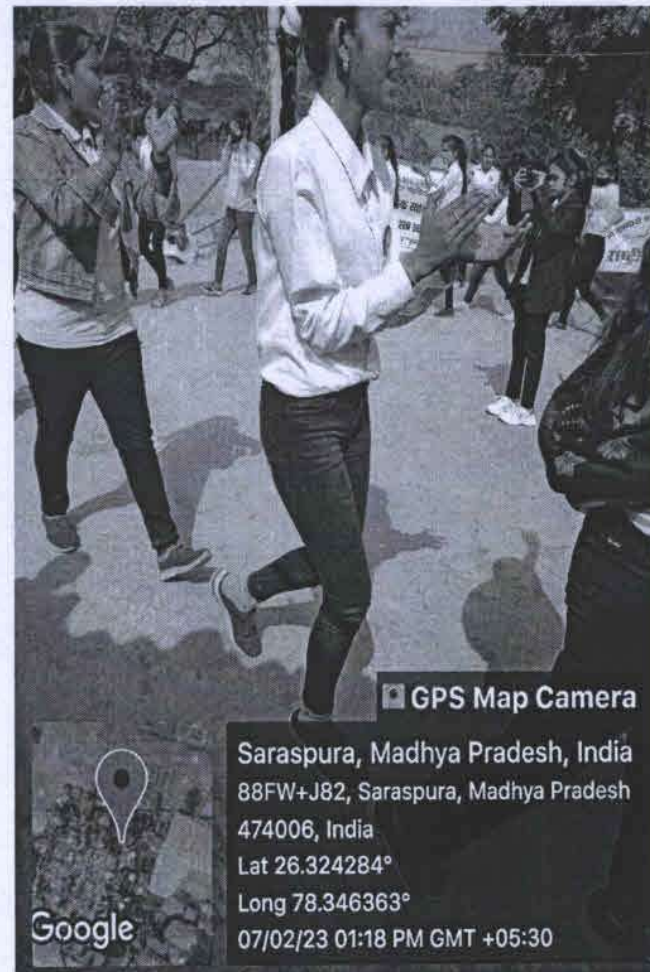
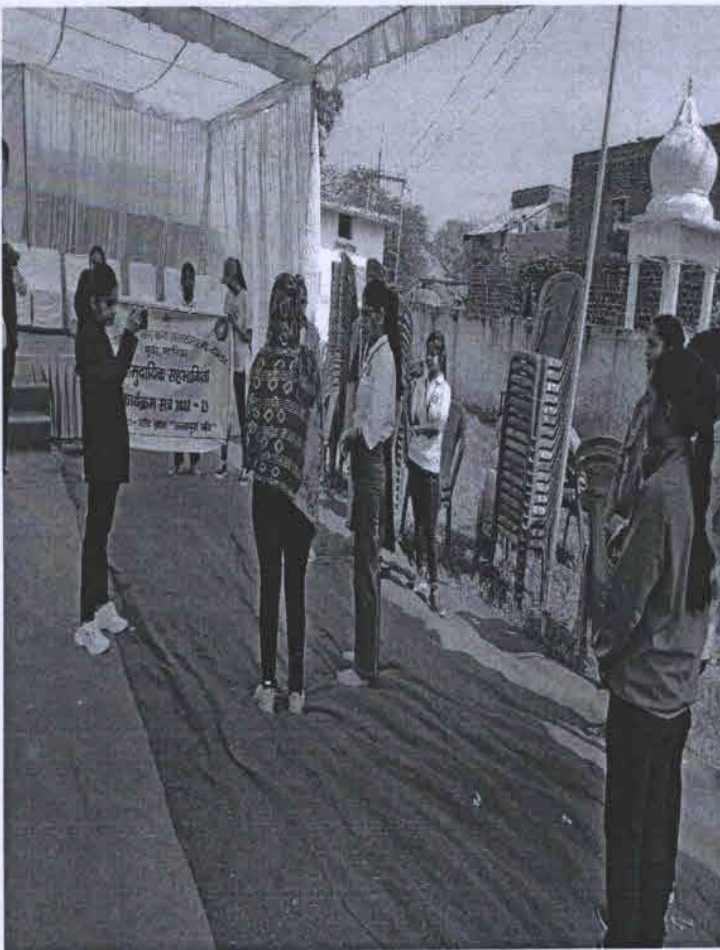
## विजयाराजे सिंधिया कन्या महाविद्यालय की छात्राओं ने गांव में पहुंचकर समझायी विभिन्न सरकारी योजनाएं

ग्वालियर। शासकीय विजयाराजे कन्या महाविद्यालय मुरार की छात्राओं के द्वारा गोद ग्राम सरस पुर गांव में सामुदायिक सहभागिता कार्यक्रम का आयोजन किया गया जिसमें महाविद्यालय की प्राचार्य डॉ सुशीला माहौर एवं आइक्यूएसी समन्वयक डॉ एसके श्रीवास्तव द्वारा छात्राओं के 55 सदस्य दल को एनएसएस अधिकारी डॉ मंजू सिंह डा कपिलवाला पांचाल एवं डॉक्टर मीसमी सिंह के साथ हरी झंडी दिखाकर खाना किया गया छात्राओं के दल ने सरसपुर गांव में पहुंचकर अलग-अलग समूहों में जाकर ग्राम वासियों से चर्चा की गांव की प्रमुख समस्याओं को जाना और सुझाव दिए विभिन्न सरकारी योजनाओं के बारे में संक्षिप्त जानकारी दी एवं सहयोग का आश्वासन भी दिया छात्राओं द्वारा गांव में नुक्कड़ नाटक का मंचन कर मद्यपान एवं नशा विरोधी और उसके दुष्परिणाम के प्रति गांव वासियों को जागरूक किया गांव की बेटियों को शिक्षा के प्रति जागरूक कर उच्च शिक्षा के लिए प्रेरित किया गया बाल विवाह एवं दहेज प्रथा जैसी



कृतियों के दुष्प्रभाव को नुक्कड़ नाटक कर उसके दुष्परिणाम बताकर पूरे गांव वासियों को जागरूक किया गया साथ ही मतदान क्यों जरूरी है उसके महत्व को भी समझाया समस्त ग्राम वासियों के साथ सरपंच उपसरपंच पंचायत सचिव आदि सभी की उपस्थिति एवं सहयोग कार्यक्रम को पूरा मिला एवं सहभागिता रही तत्पश्चात सभी

छात्राओं द्वारा अधिकारियों द्वारा ग्राम वासियों को धन्यवाद कार्यक्रम का समापन किया गया कार्यक्रम सामुदायिक सहभागिता कार्यक्रम के संयोजन की अनुमति एवं सहयोग के लिए दल की छात्राओं अधिकारियों द्वारा प्राचार्य एवं आभार व्यक्त किया गया है।



GPS Map Camera

Saraspura, Madhya Pradesh, India  
88FW+J82, Saraspura, Madhya Pradesh  
474006, India  
Lat 26.324284°  
Long 78.346363°  
07/02/23 01:18 PM GMT +05:30

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## राज्य युवा नीति बनाने को लेकर मुरार कन्या महाविद्यालय में कार्यक्रम आयोजित

मध्यप्रदेश शासन, उच्च शिक्षा विभाग के आदेशानुसार दिनांक 26-27 दिसंबर 2022 को मध्यप्रदेश युवा नीति राज्य युवा नीति बनाने की प्रक्रिया में शामिल होने हेतु कार्यक्रम के अंतर्गत विजयाराजे शा कन्या महाविद्यालय, मुरार, ग्वालियर में दिनांक 26/12/2022 को एक विशाल रैली का आयोजन किया गया। एन एस एस अधिकारी डॉ मंजू सिंह चौर के नेतृत्व में अयोजित रैली में महाविद्यालय की प्राचार्य डॉ सुशीला माहौर, दुष्ट प्रभारी डॉ एस के श्रीवास्तव, डॉ रेनु नायर, क्रीडा अधिकारी, मतदाता अधिकारी, एन सी सी अधिकारी के साथ साथ महाविद्यालय के समस्त अधिकारी कमचारी एवं बड़ी तादाद में छात्राएं शामिल रहीं। इसी क्रम में दिनांक 27/12/22 को महाविद्यालय के विवेकानंद सभागार में युवा नीति के संबंध में एक व्याख्यान एवं परिचर्चा का आयोजन भी किया गया। प्राचार्य की अध्यक्षता में आयोजित इस कार्यक्रम में मुख्य वक्ता के रूप में डॉ मनोज अवस्थी, अतिथियों में वार्ड 26 की पार्षद ममता शर्मा, वंदना प्रेमी, उपस्थित रहीं। युवा नीति पर मुख्य अतिथि एवं मुख्य वक्ता ने छात्राओं को युवा नीति में सहभागिता हेतु प्रेरित किया गया। उक्त कार्यक्रम में भी महाविद्यालय का समस्त स्टाफ एवं बड़ी संख्या में छात्राओं की सहभागिता रही। कार्यक्रम का संचालन ज्योति उपाध्याय एवम आभार डॉ नायर द्वारा किया गया।



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