

# Principal, Vijaya Raje Government. Girls Post Graduate College, Morar, Gwalior (M.P.)

https://vrgcollegegwalior.org

Telephone 2 No. 0751-2368329

(NAAC Accredited 'B+' Grade, October-2017)

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Date:

# **Declaration**

#### Matrix- 7.1.3

I declare that pictures, data, reports and other information enclosed in the criterion are authentic to the best of my knowledge.

Criterion Incharge
Dr. N.S. Niranjan







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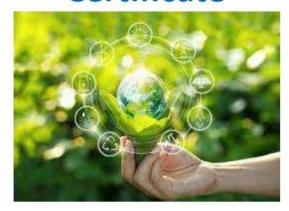




# **Green Audit Certificate**

Ref.No. SABS /GA/22-23/217 Dated 31/05/2023

# GREEN AUDIT Certificate



This is to certify that Vijyaraje 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 Vijyaraje 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











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Vijaya Raje Govt Girls PG College
Morar-Gwl

# **Green Audit Voucher**

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Green Audit in College Premises HSN Code: 9983	Job	1	25000.00	25000.00
			Total Amount	25000.00
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			Total Amount	29500.00
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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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WE BUILDS A SOLID FOUNDATION FOR SAVING ENERGY

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6	Prof. – Physics	Mr. R.K. Dandoliya

#### Acknowledgement

Sabs Energy Enviro Pvt.Ltd. is thankful to the Vijaya Raje Govt. Girls P.G. College Morar, Gwalior (M.P.) 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 field study of this audit was carried out on 22-23

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	Dr. Sushila Mahor
2	IQACIn-charge	Dr. S.K. Shrivastava
3	Accountant	Mr. Matacharan Sharma
4	Prof Economics	Dr. K. K. Shrivastava
5	Prof. –English	Mr. N.S. Niranjan
6	Prof. – Physics	Mr. R.K. Dandoliya

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

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



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# 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 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.

#### **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.

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- 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 ecofriendly 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

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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

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# CHAPTER:2 GENERAL OVERVIEW OF THE CONCEPTOF 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.

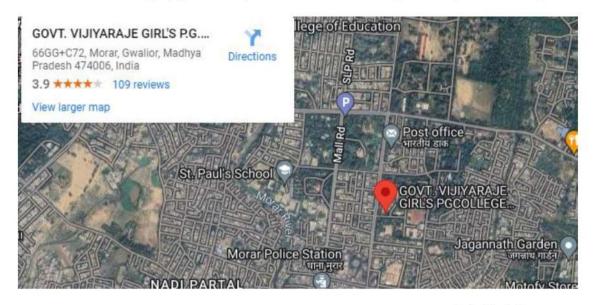


Figure 2: Vijaya Raje Govt. Girls P.G. College Morar, Gwalior Satellite View

#### 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

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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

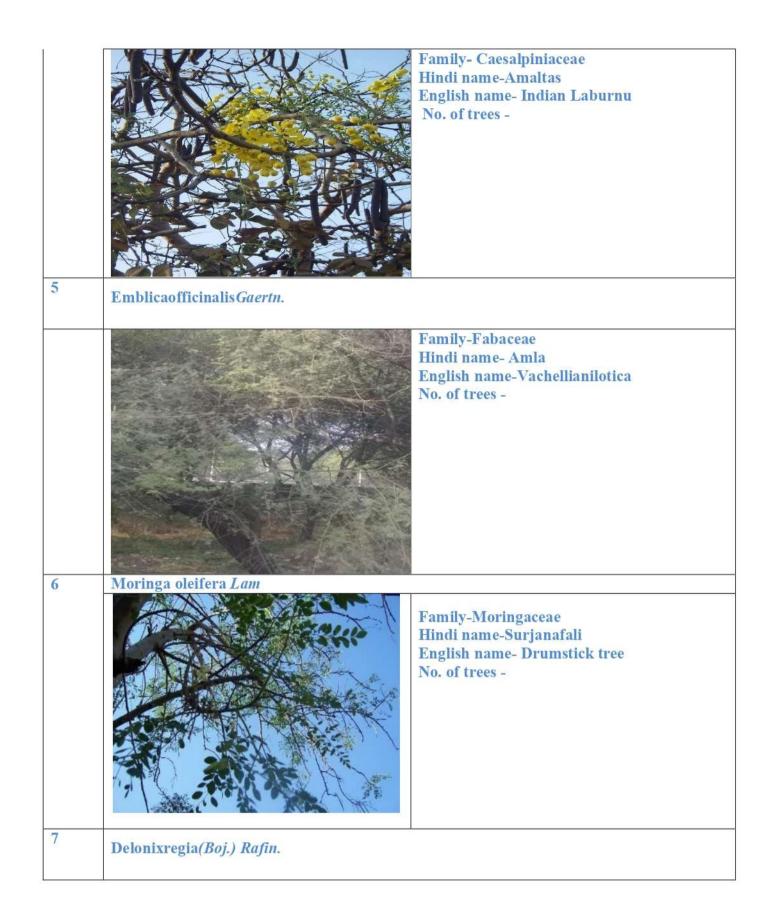
This campus harbors a rich diversity of plants. It is an old institution \ and hence some members of natural vegetation are still present here. Some plants are introduced for avenue purpose and are combined to the road facing area.

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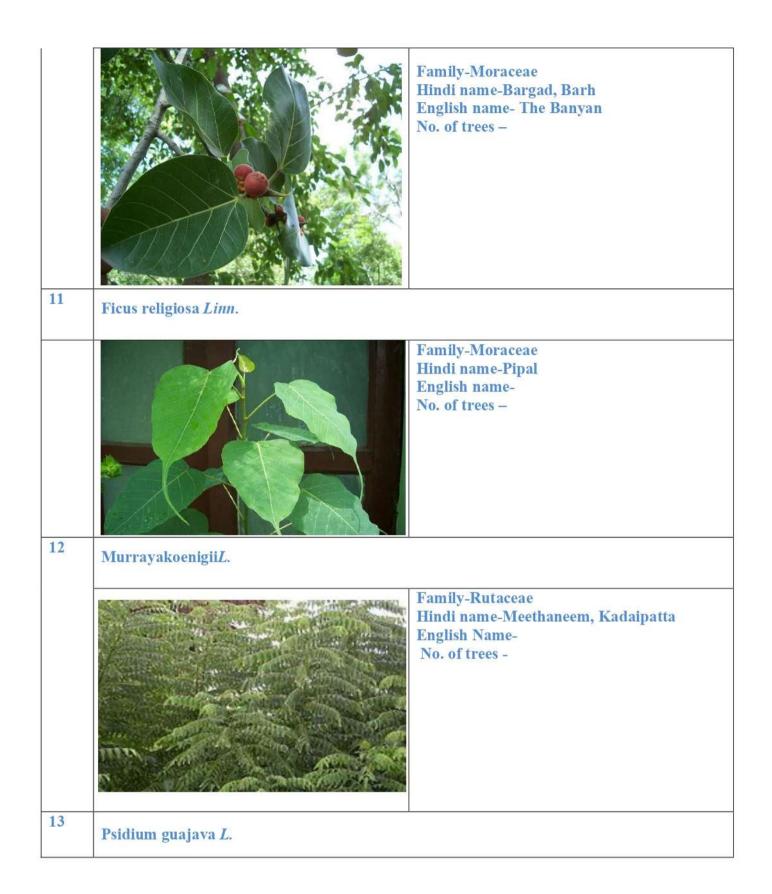


Table 1: List of Trees

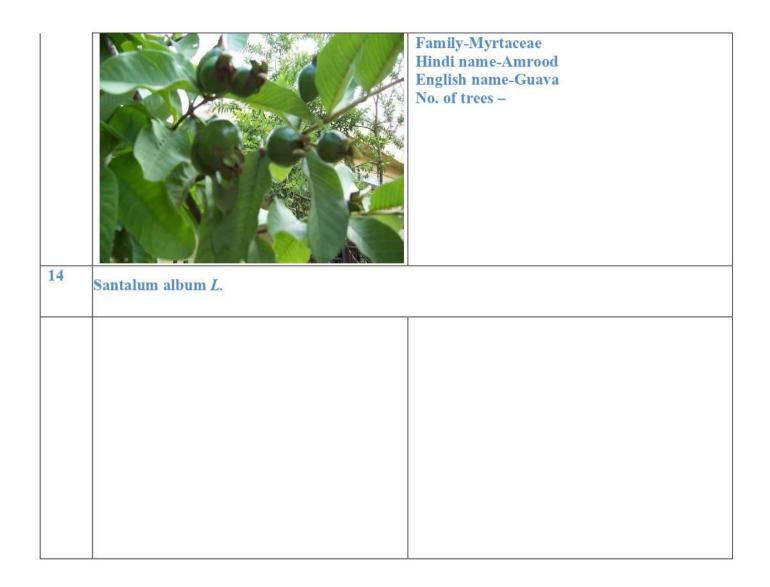
S.No	Plant Species	Specification
1	PolyalthialongifoliaThw	
		Family-Annonaceae Hindi name- Ashok English name- False ashok No. of trees -
2	Azadirachtaindica A. Juss.	
		Family-Meliaceae Hindiname-Neem English name- The Margosa Tree No. of trees -
3	DalbergiasissooRoxb	Family-Papilionaceae Hindi name-Shisham EnglishName- No. of trees -
4	Cassia fistula L.	



	2.1 Family-Caesalpiniaceae Hindi name-Gulmohar English name-Flamboyanttree No. of trees -
8	Mangifera indica L.  Family-Anacardiaceae
	Hindi name-Aam English name-Mango No. of trees -
9	
10	FicusbenghalensisL.







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

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

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

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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.





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# **GREEN PLANTATION IN THE CAMPUS**





Figure 3: Main front garden of college

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Figure 4: plant/ trees at garden of college



## GREEN PLANTATION IN THE CAMPUS







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Figure 5: Trees at college Campus

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Figure 6: Plantation activity at college Campus

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Figure 7: Plantation activity with NCC cadets at college Campus

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# 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 Cyanophylictis)
- iii. Burrowing Frog (Sphaerotheca Braviceps)

#### c) Family Rhacophoridae

i. Common tree frog (Polypedatesmaculatus)

#### d) Lizard Family

- i. House wall lizard (Hemiductylus flaviviridis)
- ii. Common Bark Gecko (Hemiductylusleschenaultii)
- iii. Brahmini (Lygosoma punctata)
- iv. Many keeled grass skink (Eutrophiscarinata)
- v. Goh or Goyra or Monitor lizard (Varanusbengalensis)
- vi. Girgit or Garden lizard (Calotesversicolor)

#### 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:

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Table 5: List of all the Birds in the campus

S. No.	Common	Scientific name
	name	
1	Crow	Corvous 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.

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#### 4.3 Details of fauna

1.	Scientific Name: - Scolopendra sp.Common Name: - CentipedeClassification: Phylum-Arthopoda Class-Chilopoda Order-Scolopendromorpha Genus-Scolopendra	
2.	Scientific Name – Poecilocerus sp.  Common Name- Grasshopper  Classification –  Phylum- Arthopoda  Class- Insecta	
	Order- Orthoptera Genus-Poekilocerus	

द्धिमुह्न Audit report fy 2022-23

3.	Scientific Name: - Carausius sp.  Common Name: - Stick insect  Classification:  Phylum-Arthopoda  Class- Insecta  Order- Plasmida  Genus-Carausius	
4.	Scientific Name: - Forficula sp  .Common Name: - Earwig  Classification:  Phylum-Arthopoda  Class- Insecta  Order- Dermaptera  Genus-Forficula	
5.	Scientific Name: – Mantis sp.  CommonName:-PrayingMantis  Classification:  Phylum-Arthopoda  Class- Insecta  Order- Dictyptera  Genus-Mantis	

द्धिमुद्धा Audit report fy 2022-23



6.	Scientific Name: - Periplaneta sp.  Common Name: - Cockroach  Classification:  Phylum-Arthopoda  Class- Insecta  Order- Blattodea  Genus-Periplaneta	
7.	Scientific Name: - 34an asp34  .Common Name: - Cloth Moth Classification: Phylum-Arthopoda Class- Insecta Order- Lepidoptera Genus-Tinea	
8.	Scientific Name: -Papilios .Common Name: - Butterfly Classification: Phylum-Arthopoda Class- Insecta Order- Lepidoptera Genus-Papilio	



9.	Scientific Name: Helixsp CommonName:-Gardensnail Classification: Phylum-Mollusca Class-Gastropoda Order-Stylommalophora Genus-Helix	
10.	Scientific Name: - 35an asp.  Common Name: - Frog  Classification:  Phylum- Chordata  Class- Amphibia  Order- Anura  Genus-Rana	
11.	Scientific Name: - Calotes sp. CommonName:-Bloodsucker Classification: Phylum- Chordata Class- Reptilia Order-Lepidoptera Genus-Calotes	

Agen Audit report fy 2022-23



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



16.	Scientific Name: . Corvussp Common Name: Crow or Kag Classification: Phylum-Chordata Class-Aves Order-Passeriformes Genus-Corvus	
17.	Scientific Name: – Pteropus sp.  Common Name: - Fruit bat orChamgadar  Classification:  Phylum- Chordata  Class- Mammalia  Order-Chiroptera  Genus-Pteropus	
18.	Scientific Name: - Funambulus sp. Common Name: - GilhariClassification: Phylum- Chordata Class- Mammalia Order- Rodentia Genus-Funambulus	
19.	Scientific Name: - Rattus sp.  Common Name: - Black rat  Classification:  Phylum- Chordata  Class- Mammalia  Order- Rodentia  Genus-Rattus	



20 Scientific Name: - Pavo cristatus
Common Name: - Indian peacock,
Classification:
Phylum- Chordata
Class- Reptile
Order- Landfowl
Genus- Pavo

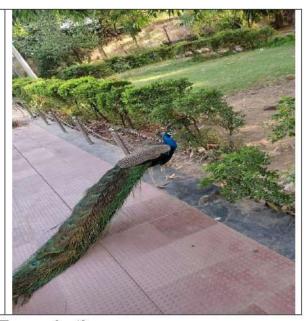


Table 6: List of all the Fauna in the campus

# 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.

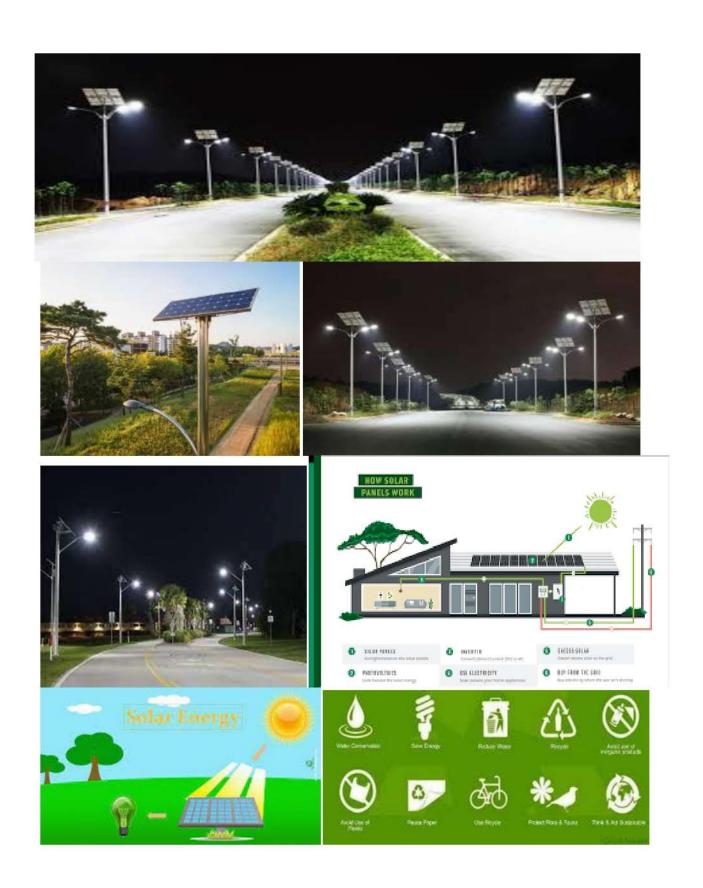
LED lights should be used at all places.

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.

CO-ORDINATOR
Vijaya Raje Govi Girls PG College



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

## **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.info@sabsindia.com,www.sabsindia.com

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







SABS ENERGY ENVIRO PVT.

LTD.WWW.SABSINDIA.COM

Works: 90/2 Abhinav Nagar Chitawad Ring Road, Tin Emali, Indore Mob. # 98260-12991, 8236088801 E-mail: sabsind@yahoo.co.in, sabsindia2018@gmail.com.

## **Energy Audit Voucher**

TAX - INVOICE SABS ENERGY ENVIRO PVT. LTD. Invoice No.: SEEPL/23-24/03 90/2 ABHINAV NAGAR, CHITWAD , INDORE (M.P.)-452001 Date : 09.05.2023 W. No. : 1504/Est./2023 PH.:0731-2477960,2 M.: +91-8236088801 EMAIL: SABSIND@YAHOO.CO.IN W.O.Date : 25.01.2023 GSTIN NO. :23ABDCS0344N1ZD Work Site CONSIGNEE Gwalior The Principal Vijayaraje Govt. Girls PG College Murar Gwalior M.P, Pin 474011 GST: S. No Description of item Unit Qty Rate(Rs.) Amount(Rs.) **Energy Audit in College Premises** 25000.00 25000.00 Job HSN Code: 9983 **Total Amount** 25000.00 SGST @9% 2250.00 **CGST @9%** 2250.00 29500.00 **Total Amount** For SABS ENERGY ENVIRO PVT. I uld be submitted within in 30 days from the date there of .else additional Tax in Ilu of formas per rules with panelty if any imposed by sales tax athority ould 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% A/C DETAILS :SABS ENERGY ENVIRO PVT LTD, UNION BANK OF INDIA ,A/C NO 497401010036477 IFS CODE :UBIN0549746, BRANCH VISNUPURI INDORE M.P.452001 CO-ORDINATOR Gwaliof Vilaya Raje Govt Girls PG College Morar-Gwl

## A letter of Work order for energy audit in the college



## 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
PRINCIPAL
PRINCIPAL
PRINCIPAL
Morar, Gwalior
Morar, Gwalior

SABS ENERGY ENVIRO PVT.

LTD.WWW.SABSINDIA.COM
Works: 90/2 Abhinav Nagar Chitawad Ring Road, Tin Emali, Indore

Mob. # 98260-12991, 8236088801 E-mail: sabsind@yahoo.co.in,sabsindia2018@gmail.com.

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

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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: <a href="mailto:sabsind@yahoo.co.in">sabsind@yahoo.co.in</a>, <a href="mailto:info@sabsindia.com">info@sabsindia.com</a>
Contact number: 8236088801, 9826012991

Energy Audit Report Vijyaraje Govt. Girls College Morar, Distt. Gwalior, M.P.

### 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	Dr. Sushila Mahor
2	IQAC In-charge	Dr. S.K. Shrivastava
3	Accountant	Mr. Matacharan Sharma
4	Prof Economics	Dr. K. K. Shrivastava
5	Prof. –English	Mr. N.S. Niranjan
6	Prof. – Physics	Mr. R.K. Dandoliya

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)

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5	Chapter-5 Lighting System	18-20
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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	-	VIJYARAJE GOVT. GIRLS COLLEGE MORAR, GWALIOR (M.P.),
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

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

1. Table 1: Connected Load (kW)

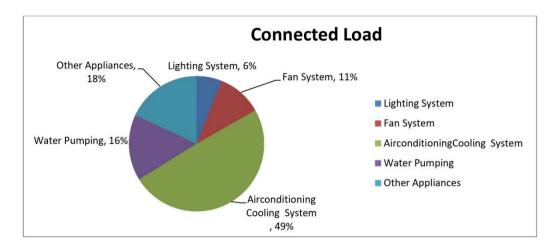


Figure 1: Electricity Connected Load details of campus in different zone

- 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 various 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 byBureau of energy efficiency, which will get huge amount of electricity saving.

- ➤ We are suggesting conducting regular **Cleaning and maintenance of lighting fixtures** inevery 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 purchases 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 toincrease 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 savingas 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.

Energy Audit Report Vijyaraje Govt. Girls College Morar, Distt. Gwalior, M.P.

## CHAPTER-01 INTRODUCTION OF THE COLLEGE

#### 1.1 Introduction

Vijyaraje 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 Surving 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 **Vijyaraje 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.

Energy Audit Report Vijyaraje Govt. Girls College Morar, Distt. Gwalior, M.P.

### CHAPTER-02 SITE VISIT AND INSPECTION

#### 2.1 Site visit and site inspection

Energy audit team visited **Vijyaraje 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

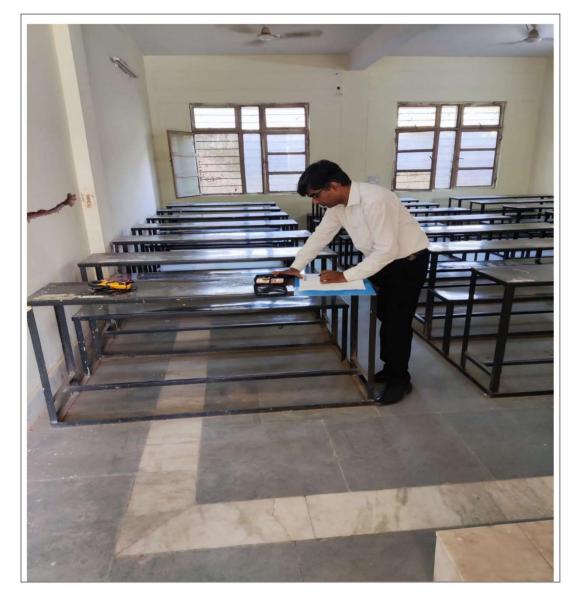


Figure 3: Vijayaraje Govt. Girls College Morar, Gwalior, Lux Measurement

### 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 programmers 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 **Vijyaraje 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:

Energy Audit Report Vijyaraje Govt. Girls College Morar, Distt. Gwalior, M.P.

- 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 equipmentbreakdown, 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

Energy Audit Report Vijyaraje Govt. Girls College Morar, Distt. Gwalior, M.P.

## CHAPTER-04 ELECTRICITY BILL ANALYSIS

#### 4.1 Month Wise Energy Consumption

**Vijyaraje 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.

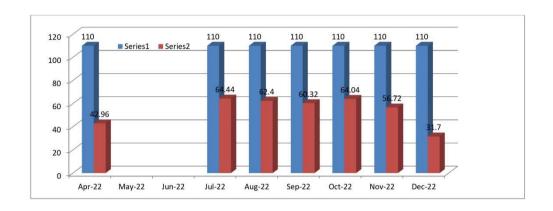
#### Tariff:

Tariff shall be as given in the following table:

	<b>Energy Charge</b>	Monthly Fixed Charge (Rs.)			
Sub category	(paise/unit) Urban/ Rural areas	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 Mandatory 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		

Energy Audit Report Vijyaraje Govt. Girls College Morar, Distt. Gwalior, M.P.

	Table 2: Electricity bill analysis							
	Monthly Electrical bill detail in Vijyaraje Govt. Girls College Morar							
		IVRS	No. N31310	021738, Addı	ress Garam	Sadak		
Months Sanctioned Load (KW) MDI kWh Charges (Rs) (Rs) Power Factor (Rs) Total bill wint 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							



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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.
- $\succ$  It is observed that Average Per unit Charges 10.48 Rs/kW.

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### **CHAPTER-05** LIGHTING SYSTEM

5.1 Details of Lighting System

Vijyaraje 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.	Sr. No. Location		No.of Lighting fixture	Power (W)	Total Power (W)	Lux Level
		LED	2	20	40	180-250
	E-Llibrary	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
	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
F: \ FI		LED	5	40	200	55-85
First Floor		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
Total Powe	er Consumption in kW				5920	
Total no	. of Lighting Fixture		175			

#### **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)		
_	Out Door	Street Light	LED	6	50	300		
1	Lighting		LED	8	50	400		
			LED	12	50	600		
Total	Total Power Consumption in kW		1.3					
T	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)
	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
1 Ground	Micro Bio	Ceiling Fan	6	68	408
Floor	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
	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
First Floor	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

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

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
Total no. of Fixture			167		10.509

#### **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.

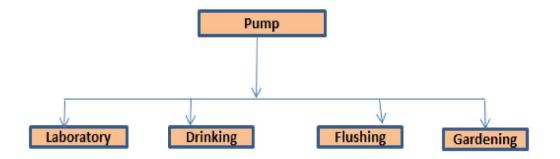


Table 8: Details of pumping system

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	
Total Power in kW					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.

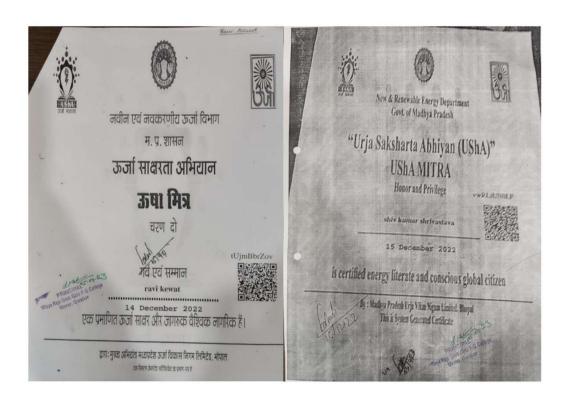
### **Energy Saving Activities Conducted by the College**





**Energy Saving Posters in Classrooms** 

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#### **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/m²)
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	
Warranty (Years)	3 Years	3 Years	3 Years	3 Years	
Blade Span (mm/inch)	900/36	1050/42	1200/48	1400/56	
RPM	450	430	350	270	
Service Value	7.1	6.6	7.8	7.7	
Input Voltage (V)	140-285	140-285	140-285	140-285	
Power Consumption (W)	28	32	28	35	
Frequency (Hz)	48-52	48-52	48-52	48-52	
Air Delivery (CMM)	200	210	220	270	
Power Factor	>0.98	>0.98	>0.98	>0.99	
No. of Blades	3	3	3	3	
Bearing (Double)	Deep Groove Double Sided Steel Shielding				
Remote Control (12 Keys)	Speed Control, Boost Mode, Timer and Sleep Mode				

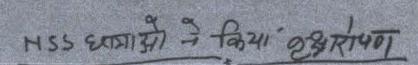


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Comparison Between Ordinary,5 Star Rated and Super-Efficient Fans

Parameters	Ordinary Fan	5 Star Rated Fan	Super-Efficient Fan
Wattage	75	50	28
RPM (speed)	380	330	360-380
CMM (air delivery)	230	210	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







## 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 पीधरोपण के लिए राजीव गांधी ग्रीन कॉरिडोर का चयन किया। कार्यक्रम में प्राचार्य डॉ. सुशीला माहौर, क्रीड़ा विभाग और एनसीसी की छात्राएं शामिल थीं।

कायक्रम अधिकारी गाङ्गिय सेवा योजना

शासकोध कन्या प्नातकात्तर महाविद्या व्याप तालेश्व (प्रशापनेश)

PRINCIPAL
PRINCIPAL
Vileya Raje Gove Biris P. G. College
Bilorat, Gwallor

IQAC CO-ORDINATOR Vijaya Raje Govt Girls PG College Morar-Gwi

## Photos of Plantation drive in the college campus





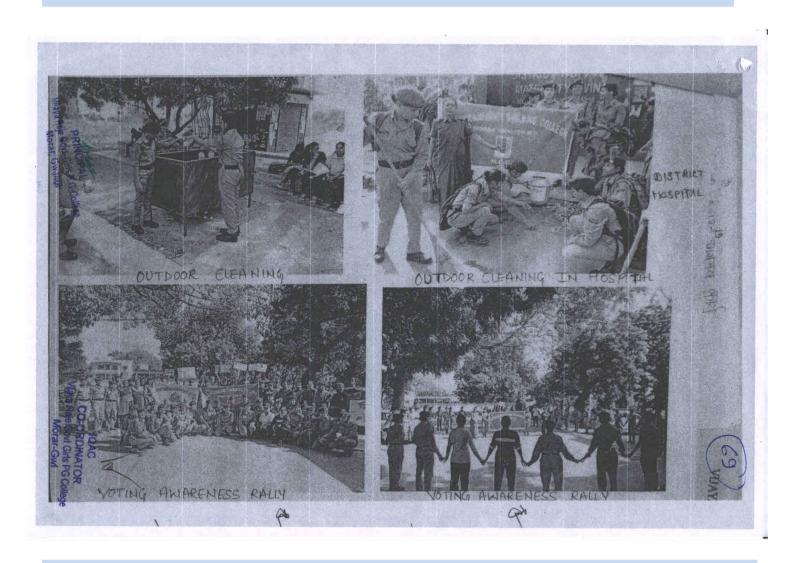
## Photos of outdoor cleaning activity







## Photos of outdoor cleaning by students of the college



Photos of voting awareness rally by staff members and students

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# 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 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, ने डॉ. मौसमी सिंह, रासेयो सहायक प कार्यक्रम अधिकारी डॉ. कपिला पांचाल, इ स्वच्छता अभियान चलाया गया इस प्रो. ममता चौहान, शिवानी साह्, क्रीड़ा अ अधिकारी श्रीमती दीपा वर्मा, वरिष्ठ ने प्राध्यापकगण, कर्मचारी एवं रासेयो हि स्वयंसेवक उपस्थित रहे।

Maya Raje Govi Girls P. G. College Morar, Gwalior

CO-ORDINATOR Vijaya Raje Govi Girls PG College Morar-GWI



## स्वच्छता अभियान













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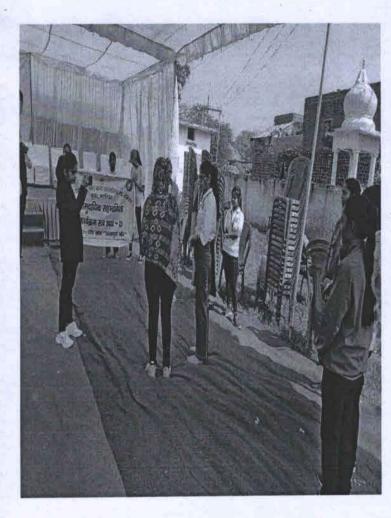
Morar-Gwi

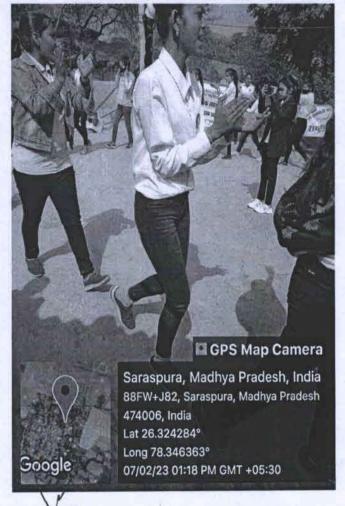
## विजयाराजे सिंधिया कन्या महाविद्यालय की छात्राओं ने गांव में पहुंचकर समझायीं विभिन्न सरकारी योजनाएं

ग्वालियर । शासकीय विजयाराजे कन्या महाविद्यालय मुरार की छाताओं के द्वारा गोद ग्राम सरस पुरा गांव में सामुदायिक सहभागिता कार्यक्रम का आयोजन किया गया जिसमें महाविद्यालय की प्राचार्य डॉ सुशीला माहौर एवं आइक्यूएसी समन्वयक डॉ एसके श्रीवास्तव द्वारा छानाओं के 55 सदस्य दल को एनएसएस अधिकारी डॉ मंजू सिंह डा कपिलवाला पांचाल एवं डॉक्टर मौसमी सिंह के साथ हरी झंडी दिखाकर खाना किया गया छालाओं 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 सस्कारी योजनाओं के बारे में संक्षिप्त जानकारी दी एवं सहयोग का आश्वासन भी दिया छालाओं द्वारा गांव में नुक्कड़ नाटक का मंचन कर मद्यपान एवं नशा विरोधी और उसके दुष्परिणाम के प्रति गांव वासियों को जागरू 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 जागरू किया गया साथ ही मतदान क्यों जस्बी है उसके महत्व को भी समझाया समस्त ग्राम वासियों के साथ सरपंच उपसरपंच पंचायत सचिव आदि सभी की उपस्थित एवं सहयोग कार्यक्रम को पूरा मिला एवं सहभागिता रही तत्पश्चात सभी छालाओं 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 छालाओं अधिकारियों द्वारा प्राचार्य एवं आभार व्यक्त किया गया है।







CO-ORDINATOR
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Morar-Gwi

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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 प्रकिया 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 बीर के नेतृत्व में अयोजित रैली में महाविद्यालय की प्राचार्य डॉ सुशीला माहौर ,हुन्नष्ट प्रभारी डॉ एस के श्रीवास्तव , डॉ रेनू नायर , फ्रीडा अधिकारी, मतदाता अधिकारी, एन सी सी अधिकारी के साथ साथ महाविद्यालय के समस्त अधिकारी कमर्चारी एवं बड़ी तादाद में छात्राएं शामिल रहीं। इसी ऋम 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 , अधितियों में वार्ड 26 की पार्षद ममता शर्मा, वंदना प्रेमी , उपस्थित रहीं । युवा नीति पर मुख्य अतिथि एवं मुख्य वक्ता ने छत्राओं को युवा नीति में सहभागिता हेतु प्रेरित किया गया ।उक्त कार्यक्रम में भी महाविद्यालय का समस्त स्टाफ ,एवं बड़ी संख्या में खत्राओं की सहभागिता रही कार्यक्रम का संचालन ज्योति उपाध्याय एवम आभार डॉ नायर द्वारा किया गया।







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