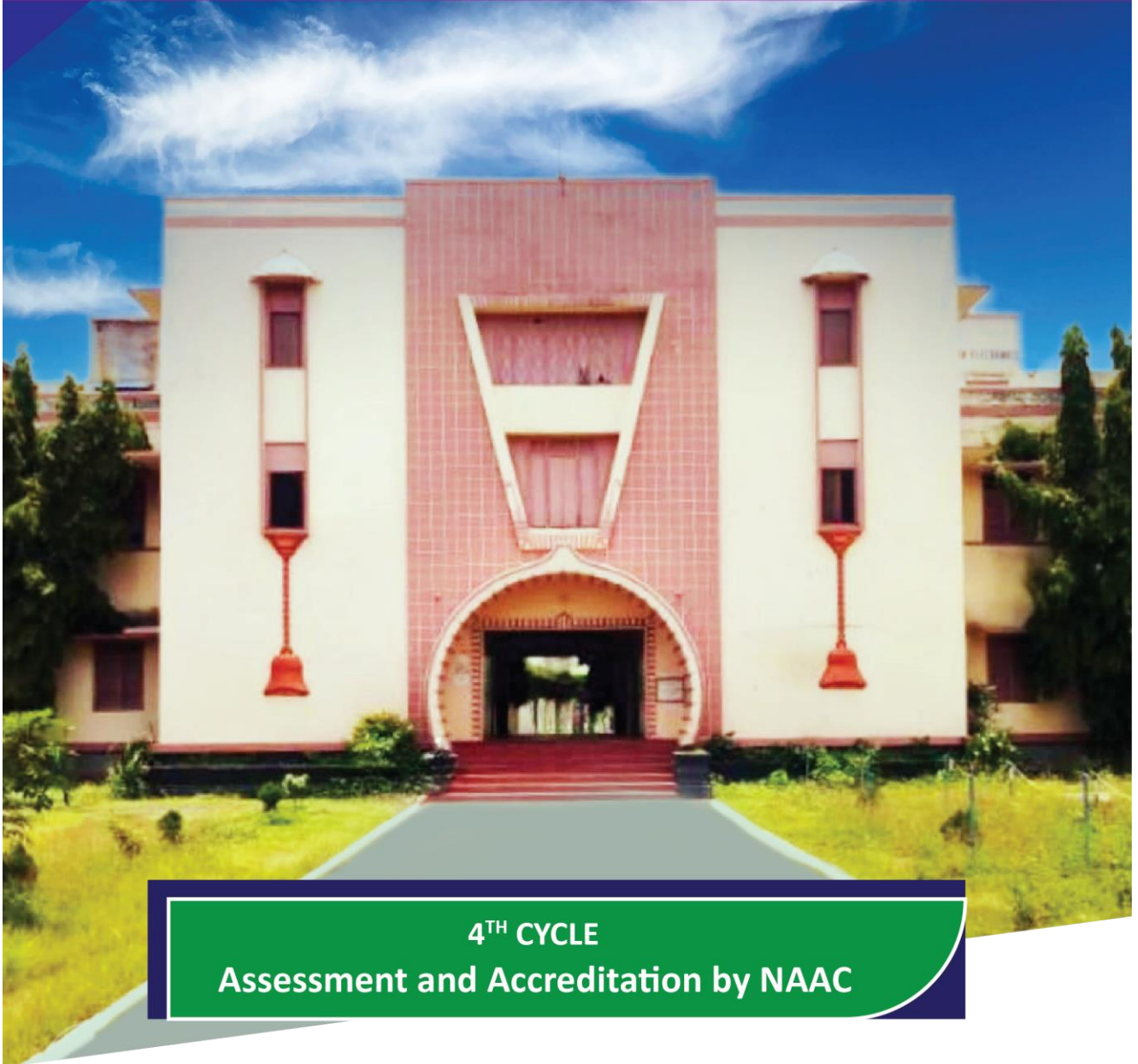




Dhamangaon Education Society's (Hindi Linguistic Minority Educational Institution)

ADARSHA SCIENCE, J. B. ARTS & BIRLA COMMERCE MAHAVIDYALAYA, DHAMANGAON RLY, DISTRICT-AMRAVATI: 444709

NAAC Accredited by B⁺⁺ with C.G.P.A. 2.81 (3rd Cycle)



4TH CYCLE

Assessment and Accreditation by NAAC

Criterion – VII

QnM: 7.1.3 Quality Audits on Environment and Energy Regularly Undertaken by The Institution (10).



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Dhamangaon Rly., Dist. Amravati, Maharashtra, India-444709



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NAAC RE-ACCREDITED 'B++' GRADE (CGPA 2.81)

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No.

Date:

21/12/2022

Declaration

The information, reports, true copies of the supporting documents, numerical data, etc. furnished in this file is verified by IQAC and found correct.

Hence this certificate.



Dr. Anand G. Naranje
IQAC Coordinator
IQAC Co-ordinator
Adarsha Sci. J. B. Arts and
Birla Commerce College
Dhamangaon Railway



Dr. Yogendra B. Gandole
Chairman, IQAC & Principal
Adarsha Mahavidyalaya,
Dhamangaon Rly.
PRINCIPAL
Adarsha Science, J.B. Arts
& Birla Comm. Mahavidyalaya,
Dhamangaon Rly.

विलासतः सर्वधन प्रधानम्

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Policy Documents of Institute



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Policy Document On Environment and Energy



Preamble :

The Environment and Energy usage Policy of Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya is to meet its energy requirements in a manner that minimizes its impact on the environment. Green Campus Committee of college is devoted to the cause of environmental awareness, to undertake green initiatives, and to conduct green literacy programmes to save energy and to protect the environment.

Vision:

This environment and energy policy is binding for all the components of the institution and applies to all its stakeholders and to the various activities undertaken by the institution. The policy aims to explore the renewable energy sources to reduce the burden of the government and to find out alternate resources as solutions to the energy crisis. It will help us to embed efficiency and environmental awareness into our everyday activities, thus helping us to realize our responsibilities and commitment to conservation of natural resources and to limit its usage.

Objectives:

- To sensitize all stakeholders towards a Clean, Green, and Sustainable Environment
- To help the students/Faculty understand everyone's responsibility to take an initiative to save the environment.
- To work with all stakeholders and the local community to adopt environmental good practice and the reduction of any adverse effects on the environment.
- To continuously improve the efficient use of all resources, including energy and water, and to reduce consumption and the amount of waste produced, recovering and recycling waste where possible.
- To ensure judicious use of environmental resources to meet the needs and aspirations of the present and future generations.

POLICY DOCUMENT ON ENVIRONMENT AND ENERGY

Policy:

Awareness: The college shall strive to create awareness on Environmental conservation among students, faculty, administrative and supportive staff and work towards sustainable development.

Eco-education: Environmental studies focusing on environmental concepts and issues will be integrated into to all academic, curricular, and extracurricular activities and programs of the College.

Green Initiatives: The college will work towards conserving and protecting natural resources for the future generation and will adopt green initiatives and sustainable measures for a clean and green campus. Activities to instill a sense of responsibility on environmental preservation will be promoted.

Pollution Management: Towards reducing pollution, steps will be taken to minimize emissions from automobiles. Authorities shall take suitable steps for a Smoke-free and Tobacco-free campus. The relevant placards will be displayed to highlight the need for a clean, green, and sustainable environment

Outreach Programmes: The college will take up initiatives through its extension activities to reach the society through campaigns, workshops, and awareness drives on pertinent environmental issues.

Criterion VII-Institutional Values and Best Practices / QnM-7.1.2

Energy saving: Graded efforts will be taken to replace out dated and energy consuming equipment with Energy efficient equipment /LED bulbs, Sensor based energy conservation measures shall be adopted. All stakeholders shall Avoid using electric lights in classrooms and halls where there is sufficient natural light

Renewable Energy: To ensure energy security and conserve Nation's natural resources, the use of renewable energy through installation of solar power panels to augment the energy needs of the college will be implemented soon in upcoming year.

Waste Management: Segregation of solid wastes in different colour coded bins will be ensured across the campus, Solid waste management of organic matter through vermicomposting will be sustained.

Ban On Single Use Plastic: Institute shall ban single use plastic altogether to minimise plastic pollution in the campus. All stakeholders will be advised to use jute or cloth products for various purposes.

Water management: The college shall take steps towards replenishing the groundwater by rainwater harvesting systems, borewell recharge system, trenches, ponds/bunds, judicious use of water resources and proper maintenance of water distribution system will be implemented

Quality audits on environment and energy: Energy Audit, Green Audit & Environment Audit to be conducted to assess and analyse the environmental impact. The analysis will be utilized to implement energy saving measures and upgrade the environmental condition in the campus.

This policy will be communicated to the students and employees via internal communication channels, and will be made available to all the stakeholders on the institutional website. The Environment and Energy Policy, objectives and targets will be reviewed on a regular basis by the Green Campus Committee and its members under the guidance of the Principal of the college.



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Policy Document on Green Campus Initiatives



Preamble:

Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya envisions a Clean and Green Campus where environmental friendly practices and education combine to promote sustainable and eco-friendly practices in the campus and beyond the campus. The green campus concept offers the institution an opportunity to take lead in redefining its environmental culture through instilling environmental ethics among students and staff. The increasing human foot print on earth poses great environmental challenges that continue to grow over time. An unprecedented effort is required to alleviate the adverse effects that human activities have on the ecosystem, effects that in turn alter how we interact with the nature and with each other. Inclusion of all approaches to problem solving will be necessary to effect a meaningful change.

Vision:

Vision for green campus is to make the campus and its surrounding green and clean and conservation of Nature and natural resources in the surrounding area and educating on how to live Eco-friendly. Clean and Green campus through adopting, practicing and promoting environmental friendly practices among students and staff to generate Eco-consciousness among them and in the world around them.

Objectives:

- To protect and conserve ecological systems and resources within the campus.
- To bring awareness among the students/Faculty about the hazards spoiling the environment.
- To help the students/Faculty understand each individual's responsibility to take an initiative to save the environment.
- To work with all stakeholders and the local community to adopt environmental good practice and the reduction of any adverse effects on the environment.
- To continuously improve the efficient use of all resources, including energy and water, and to reduce consumption and the amount of waste produced, recovering and recycling waste where possible.
- To ensure judicious use of environmental resources to meet the needs and aspirations of the present and future generations.

Green Campus Committee:

To fulfil these objectives Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya therefore has constituted Green Campus Committee

- 1) Principal of the College: Chairperson
- 2) IQAC Coordinator: Secretary
- 3) Faculty Representative: Nominated by the Principal
- 4) Faculty Representative: Nominated by the Principal
- 5) Student Representative: :General Secretary of the College
- 6) Non-Teaching Staff Representative: :Office Superintendent
- 7) Parent Representative: Secretary of the Parent Teacher Association

8) Industry Representative: Member of Alumni Association

Role and Responsibilities :

- The institutional Green Campus Committee shall perform the role of overall planning, executing and monitoring of the eco-friendly initiatives of the institution.
- Promote environmental consciousness and sustainability among stake holders and the neighbourhood community.
- Identification and implementation of alternative sources of energy and energy conservation measures.
- Implementation of effective waste management mechanisms to minimize pollution.
- Identification and implementation of water conservation measures.
- Undertake and monitor green initiatives in the campus.
- Review and implement the suggestions arising out of Green Audit.
- Institution Green Campus Initiatives
-

The Institute shall make all the necessary efforts to involve the students, faculty and staff in "Green Campus Initiatives" through NSS & NCC Units.

1) Wastewater Management/ Rainwater Harvesting:

- Repair sources of water leakage, such as dripping taps as quickly as possible.
- Installation of appliances which reduce water consumption.
- Implementation of rain water harvesting.
- Borewell recharge system
- Construction of Tanks at some places in college campus.

2) Energy Conservation Measures:

- Activate power management features on your computer and monitor so that it will go into a low power "sleep" mode when you are not working on it.
- Turn off your monitor when you leave your Table.
- Activate power management features on your laser printer.
- Whenever possible, shut down rather than logging off.
- Turn off unnecessary lights and use daylight instead.
- Avoid the use of decorative lighting.
- Use LED/Sensor based LED or compact fluorescent bulbs.
- Keep lights off in conference rooms, classrooms, lecture halls when they are not in use.
- Use the fans only when they are needed.

3) Waste Management:

- Segregation of waste into dry and wet waste from the separately allotted dustbins is done in strategic locations, thus maintaining the Campus clean and Eco- friendly. Segregated bio degradable and non-degradable waste handed over to Municipal Corporation, Chikhli.
- Chemical liquid waste generated in the lab is collected in separate soak pits which are located aloof from the water bodies.
- Reduce the practice of burning plastic and other materials that emit harmful gas on burning is prevented in the campus.
- Segregated organic waste is used to prepare compost for in-house Vermicompost project in college campus
- Papers that have been used for printing on one side shall be used rough paper work.
- Maximize use of paperless technology i.e., sharing of data /Lecture notes on google class-room, e-mail etc.

4) Landscaping with trees and plants:

- Plantation more trees within and outside the campus as a part of Go Green Campaign.
- Medication plants and trees have been planted to clean the atmosphere.

5) Restricted entry of vehicles/ Use of Bicycle/ battery powered vehicles:

- No Vehicle Day for all stakeholders shall be observed campus on every Thursday.
- Restricted entry of automobiles prompting the use of bicycles and electric vehicles as possible.
- The students shall be encouraged to avail Bus Pass facility of Maharashtra State Road Transport Corporation.
- The employees of the college whose residence is close to the college campus shall be encouraged to walk to college.

6) Plastic Ban Policy:

- Ban on use of single use plastic in college campus and in all important meetings of the college.
- Mandate faculty, non- teaching staff and students to avoid the use of plastic water bottles and to increase the use of alternate solutions like use of paper folders, cloth/jute bags, and jute files instead of plastic make items.
- Distribution of cotton bags on various occasion as a measure of plastic ban policy.

•
Major Green Campus Initiatives:

- ISO 9001:2015
- No Vehicle Day observed & Restricted entry of automobiles
- Wastewater Management/ Rainwater harvesting.
- Use of Micro-scale techniques
- Sensor based energy conservation.
- Displayed poster on Save Energy Tips
- Maintenance of water bodies and distribution system in the campus
- Single Use Plastic Free Campus
- Tree Plantation Drive & Cleanliness Drive
- Landscaping and gardens
- Use of LEDs only
- Digital Library/ E-Learning Centre
- Organization of sensitization programmes for the stakeholders
- Green, Environment and Energy Audit conducted.
- Installation of talking tree app.
- Installation of Solar Power Station

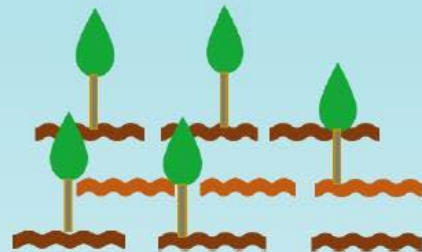


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Policy Document on Water Conservation



PREAMBLE:

Water scarcity is one growing concerns of the present times, the ultimate solution for which is water conservation. Issues related to water governance have not been addressed adequately. Mismanagement of water resources has led to a critical situation in many parts of the country. In this context our institute is committed to rain water harvesting and sustainable water management. We have taken several initiatives to conserve water such as rain water harvesting from rooftop run-offs, creation of pond/trenches and bore well recharge system, maintenance of water distribution system etc. Therefore, institute make a policy for water conservation and sustainable maintenance of resources.

VISION:

Proper water conservation measures to increase recharge of groundwater. The Col- lege views water from the three inter-related dimensions of Efficient Conservation, Responsible Consumption and Restoring and Retaining surface and groundwater.

OBJECTIVES:

- To increase recharge of groundwater by capturing and storing rainwater, by rain water harvesting from rooftop and run-offs.
- To store the water for gardening & washing purpose.
- To ensure continuous water supply to all sections and departments in college campus.
- To recharge bore well system in monsoon season.
- To Reduce wastage of water
- Soak pits to treat effluents from laboratories.
- Cleanliness drive to prevent water runoffs and clogging of waste material into nearby water sources.

FACILITIES:

- Rain water harvesting from rooftop run-offs.
- Well-developed bore well recharge system
- Low pressure & sensor-based water tabs in some areas of campus
- Water distribution system in the Campus
- Soak pits to treat effluents from laboratories.

PROCEDURE:

- Obtain an approval status from the governing body for implementation of the policy.
- Communicate the objectives of the policy and action plan to staff members and students
- Maintenance Water distribution system in the Campus through Go Green Committee



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Policy Document on Waste Management



Introduction

Higher education institutes play a vital role in the field of environment and sustainability, considering this Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya pays considerable attention to minimize the production of waste on the campus. This policy formulated by the institution envisages to guarantying the moral, social and legal responsibilities of the College in creating an environment-friendly and sustainable world devoid of unnecessary waste and over-exploitation of nature. This policy is a guidance document to the faculty, staff and students to behave responsibly in the production of waste, waste segregation, storage, handling, transport and disposal.

Vision

The policy envisions a community which is acutely conscious of the anthropogenic condition of the world and therefore strives to create an ecologically heal thy, prospering and resource efficient community, where waste is considerably reduced, recycled, reused and disposed of using an environment friendly safe method.

Objectives:

- Create consciousness among faculty and students about the ways in which waste is generated and how they can reduce waste generation and manage the waste they produce.
- To provide appropriate training for faculty, staff, students, and other stakeholders on waste management issues.
- Orienting them to adopt appropriate technologies for processing and managing solid, liquid and e-waste.
- Follow the five "R" principle of reduce, reuse, recycle, refuse, and regenerate.
- To promote holistic approach of waste management in the campus.
-

Waste Management Methods:

1) Solid Waste Management

- To keep campus, keep clean, neat and tidy, Dustbins are placed in the college premises, corridors and office.
- Cleanliness drive in campus for collection of garbage and solid waste by NSS & NCC students.
- The solid waste is segregated into organic and is used to prepare compost for in-house composting and non-degradable waste is collected by the Nagar Parishad, Dhamangaon Rly.
- Maximized use of paperless technology i.e., sharing of data /Lecture notes on google classroom, google cite, college website e-mail etc.
- All one-side used papers are utilized for routine printing activities.

2) Liquid waste management:

- Chemical liquid waste generated in the lab is collected in separate soak pits which are located aloof from the water bodies.
- The soak pits are periodically emptied and dumped in special area outside the campus and town with due care.
-

3) E-waste management:

- E-waste at our college refers to electronic equipment that has gone out of use. The cartridge of printers is refilled from a suitable vendor and reused it.
- Canteen wastewater shall be managed through sedimentation pits which are cleared periodically of the waste and the rest of the water shall pass into the traditional drain
-

Audit Report

1. Green Audit Report
2. Energy Audit Report

GREEN AUDIT REPORT

(2021-2022)



**Adarsha Science, J. B. Arts & Birla Commerce Mahavidyalaya,
Dhamangaon Rly**

Green Audit Team-

- 1. Dr. A. G. Naranje – IQAC Coordinator**
- 2. Dr. S. O. Qureshi – IQAC Co-Coordinator**
- 3. Mr. S. T. Pendum – Green Audit Coordinator**
- 4. Dr. S. V. Manohare - Member**
- 5. Dr. S. P. Patil – Member**
- 6. Dr. R. R. Dahake – Member**
- 7. Mr. G. S. Mendhe - Member**
- 8. Dr. Harshal Mungase - Member**



Report on Green Audit

Green Audit Executive Summary

Colleges and Universities have broad impacts on the world around them, both negative and positive. The colleges are in a unique position to be leaders in providing environmentally sustainable solutions to challenges faced by the society. Green Audit is linked to Sustainable development process. Through Green Audit, one gets a direction as how to improve the condition of environment. The process of green audit involves energy conservation, use of renewable sources, rain water harvesting, and efforts of carbon neutrality, plantation, hazardous waste management, E-waste management etc.

It is necessary to conduct green audit in college campus because students have to be aware about environment through green audit, its advantages to save the planet and thereby get motivated to become good citizens of the country. Green audit and sustainable development process help to reduce wastage and associated cost as well as increase the product quality. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more relevant.

Green audit can be a useful tool for a college to determine how and where they are using most of energy, water or other resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. Green auditing can also create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of the impact of green methods on campus. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers.

All across the world, colleges and universities are looking to a sustainable future by working to become carbon neutral. Universities are taking responsibility for their environmental impact and are working to neutralize those effects. To become carbon neutral, universities are working to reduce their emissions of greenhouse gases, reduce their use of energy, use more renewable energy, and emphasize the importance of sustainable energy sources.

Adarsha Mahavidyalaya, Dhamangaon Rly has conducted a green auditing during the period of 2021-22. This audit process involved initial interviews with management to clarify policies, activities, records and the co-operation of staff and students in the implementation of mitigation measures. This was followed by staff and student interviews, collection of data through questionnaire, review of records, observation of practices and observable outcomes. In addition, the approach ensured that the management and staff are active participants in the green auditing process in the college.

The findings of this report show that the college performs fairly well on sustainability issues and has made possible rectifications on the previous audit recommendations within a period of two years. The college does consider the environmental impacts of most of its actions and makes a concerted effort to act in an environmentally responsible manner. Even though the college does perform fairly well, the recommendations in this report highlight many ways in which the college can work to improve its actions and become a more sustainable institution.

Chapter I

Introduction

1.1 Green Campus, a Tool for Environmental Protection and Conservation:

The modernization and industrialization are the two important outputs of twentieth century which have made human life more luxurious and comfortable. Simultaneously, they are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources and finally making our mother Earth ugly and inhospitable. Today, people are getting more familiar to the global issues like global warming, greenhouse effect, ozone depletion and climate change etc. Now, it is considered as a final call by mother Earth to walk on the path of sustainable development. The time has come to wake up, unite and combat together for sustainable environment.

Considering the present environmental problems of pollution and excess use of natural resources, Hon. Prime Minister, Shri. Narendra Modiji declared the Mission of Swachch Bharat Abhiyan. Also, University Grants Commission has mentioned “Green Campus, Clean Campus” mission mandatory for all higher educational institutes. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

Green campus is the most efficient ecological tool to solve such environmental problems. It is a process of regular identification, quantification, documenting, reporting and monitoring of environmentally important components in a specified area. Through this process the regular environmental activities are monitored within and outside of the concerned sites which have direct and indirect impact on surroundings. Green audit can be one of the initiative for such institutes to account their energy, water resource use as well as wastewater, solid waste, E-waste, hazardous waste generation. Green Audit process can play an important role in promotion of environmental awareness and sensitization about resource use. It can create consciousness towards ecological values and ethics. Through green audit one can get direction about how to improve the condition of environment.

1.2 Need of Green auditing:

Green auditing is the process of identifying and determining whether institutions practices are eco-friendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources like energy, water, chemicals are become habitual for everyone especially, in common areas. Now, it is necessary to check whether our processes are consuming more than required resources? Whether we are handling waste carefully? Green audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it in to green and clean one. Green audit provides an approach for it. It also increases overall consciousness among the people working in institution towards an environment.

1.3 Goals of Green audit:

College has conducted a green audit with specific goals as:

1. Identification and documentation of green practices followed by college.
2. Identify strength and weakness in green practices.
3. Conduct a survey to know the ground reality about green practices.

4. Analyze and suggest solution for problems identified from survey.
5. Assess facility of different types of waste management.
6. Increase environmental awareness throughout campus.
7. Identify and assess environmental risk.
8. Motivates staff for optimized sustainable use of available resources.
9. The long term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issue before they become problem.

1.4 Objectives of Green audit:

1. To examine the current practices which can impact on environment such as of resource utilization, waste management etc.
2. To identify and analyse significant environmental issues.
3. Setup goal, vision and mission for Green practices in campus.
4. Establish and implement Environmental Management in various departments.
5. Continuous assessment for betterment in performance in green practices and its evaluation.
6. To prepare an Environmental Statement Report on green practices followed by different departments, support services and administration building.

1.5 NAAC criteria VII Environmental Consciousness:

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

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

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

1.6 Benefits of Green Audit to an Educational Institute:

There are many advantages of green audit to an Educational Institute:

- It would help to protect the environment in and around the campus.
- Recognize the cost saving methods through waste minimization and energy conservation.
- Find out the prevailing and forthcoming complications.
- Empower the organization to frame a better environmental performance.
- It portrays good image of institution through its clean and green campus.
- Finally, it will help to build positive impression for through green initiatives the upcoming NAAC visit.

1.7 About College-

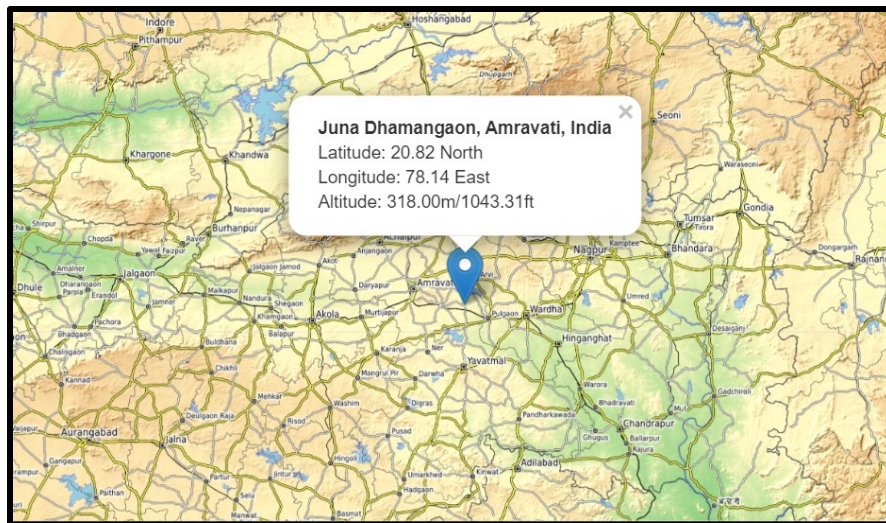
The college was established in the year 1961 under the aegis of Dhamangaon Education Society- one of the oldest institutions in Vidarbha Region catering to the needs of education since 1914. Situated on its own spacious campus on Anjansingi Road, it is affiliated to Sant Gadge Baba Amravati University, Amravati. It offers instructions through English and Marathi medium. The teaching departments are manned by competent staff and are provided with modern, well-equipped laboratories. The administrative section is computerized, so that maintenance and retrieval of records has become easier.

In 1961, this college started with the faculty of Arts & Commerce. However, Science faculty was added later in the year 1972. Presently, this college is a multidisciplinary one, with B.A., B.Com.(Marathi and English medium), B.Sc., B.C.A., M.A. (Economics), M.Com. M.C.M., M.Sc. in Mathematics, Microbiology, Zoology and Electronics, Ph.D. in Botany, Zoology, Mathematics, Microbiology, Electronics and Commerce. Junior College of Science, Arts & Commerce education. The college is a pioneer to start Microbiology & Computer education in entire Vidarbha region since 1979 and 1987 respectively. College offers Computer Science as one of the electives in faculty of Science. Career Oriented Courses like- Web Designing and Office Automation, Clinical Laboratory Technology are also available. Information Technology (IT) as an elective subject is offered at Junior College level.

Students of this college come out with flying colours which of course is a prestigious factor. Our students have brought laurels by fetching prizes, even topping the list, at National Level Essay Competition organized by Bhabha Atomic Research Centre, Mumbai during last few years. It may not be out of place to add here that probably this is the only college in the region participating in this National Level Competition consistently since 1996.

The department of Games & Sports is very active. It is due to their able guidance and constant efforts many of the students could shine in various events. Students are not only selected in university teams but also in District, State and national level teams.

Geographical Location of the college:



Administrative building, Adarsha Mahavidyalaya, Anjansingi Road, Dhamangaon Rly

Building Block A	Administrative Building, Chemistry, Zoology, Botany, Physics, Electronics, Mathematics, Microbiology and Science Class rooms and departments
Building Block B	Political Science, Economics, History, Marathi, English and Sanskrit Class rooms, Library
Building Block C	Commerce class rooms, History and Economics department
Building Block D	Commerce Department, Indoor stadium, Auditorium, Health Center, IQAC centre, Canteen,

Chapter II

Methodology

2.1 Background of Adarsha Mahavidyalaya Green Audit preparation:

This is being the first attempt to conduct Green Audit of Adarsha College, Dhamangaon Rly campus; the report not only includes the data regarding the use of resources but also highlights the biodiversity status of College. The resource utilization of Water and Electricity, Solid waste generation, E waste, Hazardous waste, Noise and Air monitoring, wastewater generation etc. on college campus are studied through this Green Audit process. Besides, these observations, the report also includes the information about the social responsibility taken by college.

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

- Environmental Auditing Process
- Planning
- Choosing audit team
- Inspecting site/ Collection of data
- Analyzing results of audit
- Evaluating audit

2.2 Survey by Questionnaire:

Baseline data for green audit report preparation was collected by questionnaire survey method. Questionnaires prepared to conduct the green audit in the college campus is based on the guidelines, rules, acts and formats prepared by Ministry of Environment, Forest and Climate Change, New Delhi, Central Pollution Control Board and other statutory organizations. Most of the guidelines and formats are based on broad aspects and some of the issues or formats were not applicable for college campus. Therefore, using these guidelines and formats, combinations, modifications and restructuring was done and sets of questionnaires were prepared as solid waste, energy, water, hazardous waste, and e-waste. All the questionnaires comprises of group of modules. The first module is related to the general information of the concerned department, which broadly includes name of the department, month and year, total number of students and employees, visitors of the department, average working days and office timings etc. The next module is related to the present consumption of resources like water, energy, or the handling of solid and hazardous waste. Maintaining records of the handling of solid and hazardous waste is much important in green audit.

There are possibilities of loss of resources like water, energy due to improper maintenances and assessment of this kind of probability is necessary in green audit. One separate module is based on the questions related to this aspect. Another module is related to maintaining records, like records of disposal of solid waste, records of solid waste recovery etc. For better convenience of the surveyor, some statistics like, basic energy consumption characteristics for electrical equipment etc. was provided with the questionnaires itself.

2.3 Onsite visit and observations:

The Adarsha Mahavidyalaya has vast built up area comprising of various departments, administrative building, teachers and staff room, IQAC centre, Auditorium, Indoorstadium, sports complex and garden. All these amenities have different kind of infrastructure as per their requirement. All these buildings were visited by the surveyors and the present condition is checked with the help of the questionnaires. Personal observations were made during the onsite visit. All the amenities were clubbed in as per their similarities and differences, which makes the survey and further analysis easier. For the data compilation purpose the college Departments and support services were clubbed into Four Blocks and given coding as Building Block A, Building Block B, Building Block C and Building Block D. The details of the Blocks are as follows:

Table No. 2.1 Details of each block including the various departments

Sr. No.	Name of the Building Block	Code
1	Administrative and Science Block	Building Block A
2	Arts and Library Block	Building Block B
3	Commerce Block	Building Block C
4	Support Services	Building Block D

After collection of secondary data, the reviews related to each environmental factor were taken by the green audit team. The data was tabulated. Depending upon the observations and data collected, interpretations were made. The lacunas and good practices were documented. Finally, all the information was compiled in the form of Green Audit Report.

2.4 Data analysis and final report preparation:

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

Table No. 2.1 Categorisation of college departments and support services at Adarsha College Campus.

Building Block A	Administrative Building, Chemistry, Zoology, Botany, Physics, Electronics, Mathematics, Microbiology and Science Class rooms and departments
Building Block B	Political Science, Economics, History, Marathi, English and Sanskrit Class rooms, Library
Building Block C	Commerce class rooms, History and Economics department
Building Block D	Commerce Department, Indoor stadium, Auditorium, Health Center, IQAC centre, Canteen,

Chapter III

Water and Wastewater Audit

Water which is precious natural resource available with fixed quantum. The availability of water is decreasing due to increasing population of nation, as per capita availability of utilizable water is going down. Due to ever rising standard of living of people, industrialization, urbanization, demand of fresh water is increasing day by day. The unabated discharge of industrial effluent in the available water bodies is reducing the quality of these ample sources of water continuously. Hence, the national mission on water conservation was declared by the then Hon. Prime Minister Narendra Modi as 'Jal Shakti Abhiyan' and appealed to all citizens to collectively address the problem of water shortage, by conserving every drop of water and suggested for conducting water audit for all sectors of water use. Water audit can be defined as a qualitative and quantitative analysis of water consumption to identify means of reducing, reusing and recycling of water. Water Audit is nothing but an effective measure for minimizing losses, optimizing various uses and thus, enabling considerable conservation of water in irrigation sector, domestic, power and industrial as well. A water audit is a technique or method which makes possible to identify ways of conserving water by determining any inefficiencies in the system of water distribution. The measurement of water losses due to different uses in the system or any utility is essential to implement water conservation measures in such an establishment.

3.1 Importance of Water Audit:

- Systematic process
- May yield some surprising results
- Easier to work on solutions when the problems are identified.
- A tracking mechanism can be put into place.

It is observed that a number of factors like climate, culture, food habits, work and working conditions, level and type of development, and physiology to determine the requirement of water. The community which has a population between 20,000 to 1,00,000 requires 100 to 150 liters per person (capita) per day. The communities with a population can consume over 1, 00,000 requires 150 to 200 liters person (capita) per day. As per the standards provided by WHO Regional office for South East Asia Schools require 2 liters per student; 10-15 liters per student if water-flushed toilets, Administration requires (Staff accommodation not included) 50 liters per person per day, Staff accommodation requires 30 liters per person per day and for sanitation purposes it depends on technology.

3.2 Water Audit:

Water usage can be defined as water used for all activities which are carried out on campus from different water sources. This includes usage in all residential halls, academic buildings, on campus and on grounds. Wastewater is referred as the water which is transported off the campus. The wastewater includes sewerage, residence, hall water used in cooking, showering, clothes washing as well as wastewater from chemical and biological laboratories which ultimately going down in sink or drainage system.

- Measurement
- Calculations
- Audit Observation
- Report
- Discussion

- Planning and Process
- Finalization
- Implementation
- Zeroing on conservation
- steps that can be taken

3.3 Study Area:

Dhamangaon Railway is a tehsil place and municipal council of Amravati district in the state of Maharashtra. Dhamangaon Railway lies between 20°46'00" N to / 20°76'67" N latitude and 78°10'00" E to 78.1667"E / 20.7667; 78.1667 longitude. It is situated at an average elevation of 291 metres. The main water sources of Dhamangaon railway are river water, well or hand pump and dug well waters.

Water Quality Assessment

Water samples from four different locations were collected and analyzed for its quality parameters. The samples includes a well water which are the main water source of the college campus and two tap water samples which is used for canteen and drinking water cum cooler systems. The samples were collected, preserved and analyzed for various physio-chemical parameters. The major parameters analyzed include dissolved oxygen, acidity, alkalinity, chloride, hardness, pH, conductivity, total dissolved solids and salinity. The results are presented in the Table 1. The results are comparable with the values of drinking water standards prescribed by different agencies.

Table 1. Results of water quality

Parameters	Well water	Water filter	Standard value (BIS)
Temperature °C	25	25	25
Turbidity (NTU)	0.02	0.01	5-15
Alkalinity (mg/l)	280	40	200
Chloride (mg/l)	20	10	250
Hardness (Total)	216	36	200
Conductivity (µs)	903	249	
pH	7.2	7.9	6.5-8.5
Total Dissolved Solids (ppm)	587	162	500
Fluoride mg/l	1.0	0.6	1-1.5
Nitrate mg/l	56	27	45
Iron mg/l	0.07	0.02	0.3
Calcium mg/l	90	8	75-200
Magnesium mg/l	3.8	3.8	30-100
Sodium mg/l	49	13	200
Chloride mg/l	20	10	250-1000
Sulphate mg/l	68	26	200-400
Total coliform	-	-	0
Fecal coliform	-	-	0

Waste management

Waste management is important for an eco-friendly campus. In a college different types of wastes are generated, its collection and management are very challenging. The following data provide the details of the waste generated and the disposal method adopted by the college.

Total number of stakeholders in the college: 2864

Total number of building (Departments, Class rooms, canteen, office, auditorium, library etc): 9

Table . Different types of waste generated in the college and their disposal

Types of waste	Particulars	Disposal method
E-Waste	Computers, electrical and electronic parts	Direct selling
Plastic waste	Pen, Refill, Plastic water bottles and other plastic containers, wrappers etc	Direct selling, Eco brick plant carry,
Solid wastes	Damaged furniture, paper waste, paper plates, food wastes	Reuse after maintenance energy conversion
Chemical wastes	Laboratory waste	Neutralise with water
Waste water	Washing, urinals, bathrooms	Soak pits
Glass waste	Broken glass wares from the labs	Direct selling

Water Management

The source of water used in the College are one wells present in the campus. These wells are recharging with rainwater from the roof. A total of 9000L of water is pumped out from the well every day (Table 2). Wastage of water from the lab is reduced by adopting microscale analysis. An average of 180,000 L of water is used by the College per month.

Sr. No.	Parameter	Response
1	Source of water	Well
2	No of Wells	01
3	No of motors used	02
4	Horse power – Motor	1-1HP, 2- 1HP
5	Depth of well –Total	12 meter
6	Water level	06 meter
7	Number of water tanks	13
8	Capacity of tank	1000 L-07 2000 L-01 500 L-02
9	Any water wastage/why?	Nil
10	Water usage for gardening	1000 L/day
11	Waste water sources	Lab, Canteen
12	Use of waste water	Rain water use as distilled water for practical
13	Any wastewater treatment for lab water	Nil
14	Whether any green chemistry method practiced in labs	“Micro scale analysis “is implemented for Chemistry students
15	Rain water harvest available?	Yes

16	No of units and amount of water harvested	02
17	Any leaky taps	No
18	Amount of water lost per day	Nil
19	Any water management plan used?	Water management audit conducted
20	Any water saving techniques followed?	Water harvesting

Soil Quality assessment

Soil samples were collected from four locations of the campus and analysed for the basic parameters. The results are tabulated and presented in the table.

Parameter	Normal	Result	Remark
pH	6.5-7.5	8.10	Medium basic
EC	0-1	0.32	Normal
Total organic carbon (%)	0.40-0.60	0.42	Medium
Phosphate (kg/hector)	14-21	22.50	Much Normal
Potassium (kg/hector)	150-200	1236.48	Very high
Nitrogn (kg/hector)	280-420	132.50	Very low
CaCo ₃	2.5-5.0	20.18	Very high
Ca	4-9.99	32.96	High
Mg	0.50-3.99	20.84	High
Na	5-15	29.09	High

Waste management Practices adopted by the college -

For the last few years, college is following zero organic waste protocol throughout the campus. The food waste generated by the students and staffs are taken by them to their own home, so that, minimum waste is generated inside the campus. Leaf litters waste and other plant waste were used to fed in the vermin-compost pit and the resulting vermin-cast is used as manure in the garden.

A. Waste Management

1. Solid Waste Management

E – Waste Management:

Waste management is important for an eco-friendly campus. In college different types of wastes are generated, its collection and management are very challenging. The following data provide the details of the e - waste generated and the disposal method adopted by the college. Total number of Regular stakeholders in the college: 2864

Total number of Regular stakeholders in the college: 2864	
Total number of Places in the college as a source of E - Waste (Different Departments, Administrative office, etc):	2

Different types of waste generated in the college and their disposal		
Types of waste	Particulars	Disposal Method
E-Waste	Computers, electrical and electronic parts	Direct Selling/Replacing with the new units from different vendors.

1. Organic Biodegradable Waste:

Vermicompost Unit:

Our college has Vermicompost unit for collection of garbage in it. It is biocompatible and of natural origin. Using this Mechanism whole degradable organic waste like leaf litter of the college can be recycled. Vermicompost which is formed after the activity of the Earthworms in the Vermicompost Unit is utilized as a replacement of Chemical fertilized in the college premises.

Compost Unit:

It has been estimated that Plant leaf litter and other organic waste of the college comprises near about 70 to 75 % of the total college solid waste. This biodegradable waste can be recycled by taking use of microorganism-based degradation and excellent quality of green compost can be made, this compost can be use as a replacement of harmful chemical fertilizers for college garden plants and for other plants in the college premises. For this, college has constructed natural composting units in the college Botanical Garden and at another accessible place. All the staff members, students, workers are strictly advised to make use of this composting unit in regular basis.



Vermicomposting Unit



Simple Compost Unit

2. Dust Bins in the College Premises

In our college campus all the laboratories, cabin and corridor are having dustbins. Laboratories are having separate dustbins for dry and wet wastage. The use of dustbins maintains garbage free campus.

3. No use of Plastic in College Canteen

Our canteen uses paper plates, newspapers, utensils so as to control the use of plastic on the college campus. It has helped in keeping the campus plastic free.

4. Use of Dust Proof Chalks

In our college some classrooms and laboratories are fitted with white board and at other places dust free chalks are used.

5. Minimum use of Photocopy and Printing

In the college paper data is converted into soft copies and procedures are digitalized which minimizes the use of printing papers. We also put Instruction banners on each Photocopy/ Printing machine to use. The maximum working procedures are paperless. We take the

already one-sided Photocopy papers in use to avoid the maximum use of papers. Only justifiable printing is allowed in the college.

6. Single Use Plastic:

Department of Botany in association with NSS unit has arranged many programs to create awareness among students, college staff and peoples of the society about serious consequences of plastic and its effect on sustainability of resources. College has arranged Cycle Rallies, Pathanaty, Slogan Campaign, Poster competitions etc.



7. Eco Brick Program

Department of Commerce and NSS Unit of the college collectively organized this campaign for environment protection since academic year 2018. Plastic bottles are made filled with pieces of plastic waste and converted into Eco- Bricks. These Plastic filled bottles are used as a brick during construction work in the college premises and all plastic which cannot be degraded naturally will be permanently fitted at the construction site. For this purpose, all the students of the college including teaching, non-teaching staff are requested to bring household plastic filled in the plastic bottles and at college level they have been converted into "Eco-Bricks".

During previous two years, near about 850 Kg of plastic is converted into eco bricks and used during construction work in the college.

Up till now, Plant carry has been constructed using these eco bricks and in front of Commerce Department, Eco brick Tank has been constructed for the plantation for shrubs to increase aesthetic value of the premises.

“Eco Brick Campaign”



2. Sewage Water Management

College authority has identified many sources which are responsible for production of sewage water. They are as follows

SN	Sewage Water Source	Number	College block
1	Drinking water Places	04	A
2	College Common Urinal	01	B
3	Girl's Common Room	02	B
4	Boys Common Urinal	01	Separate
5	College Common Toilet	01	C
6	College Departmental Toilet	07	D
7	Wash Basins	15	Whole College

It has been estimated that 500 liters / day sewage water has been produced by these sources in the college premises. Most part of this sewage water is deviated towards the septic tanks and some part of it is directed towards Soaking Pits that has been constructed at each source of sewage water for the conservation of the water instead of discharging that water directly into the environment. Other attempts have been made to provide this reusable water to the plants around the college campus for its reuse.



Sewage water is discharged directly underground to the plants

B. Soil Management

8. Vermicomposting Unit

Our college has Vermicompost unit for collection of garbage in it. It is biocompatible and of natural origin. Using this Mechanism whole degradable organic waste like leaf litter of the college can be recycled. Vermicompost which is formed after the activity of the Earthworms in the Vermicompost Unit is utilized as a replacement of Chemical fertilized in the college premises.



Vermicompost Unit Constructed in the College Botanical Garden

9. Soil Erosion

Soil is very important edaphic factor for the whole terrestrial ecosystem. But due to human anthropogenic activities, Erosion of soil is happening very rapidly. College authority has identified vulnerable places in the college premises where soil erosion is likely to be takes place every year due to heavy rain, flood, temperature and deforestation. Special attempt has been made to level up all the upper strata of college campus soil. Expert personals from Gram panchayat Karyalaya, Dhamangaon Rly has been requested to visit the college and leveling and drainage system of the college campus ground has been constructed.

10. No Use of Chemical Fertilizers in the college:

College authority has strictly advised to the all departments of the college along with the respective students, working persons of the college to restrict use of chemical fertilizers during all soil related activities in the college premises. This will help to reduce soil pollution at remarkable level and help to go in organic direction.

C. Tree Plantation

SN	Theme	Location	Plants
1.	Oxygen rich	Throughout the Campus	Tulsi, Pimpal, Neem
2.	Beauty	Front of College Gate	Ficus, Croton, Delonix, Bombax
3.	Medicinal Plants	Campus	Bahava, Adulsa, Tulsi, Ran Korpadi, bael, etc
4.	Climbers	Compound Wall	Madhumalti, Gokarn, Gulvel
5.	Shade	Avenue in the Campus	Teak, Melingtonia, Neem, Bakul, Banyan Tree, Pimpal etc
6.	Avenue	College road	Gulmohar, Amaltash
7.	Palms	Campus	Areca palm
8.	Gymnosperms	Campus	Cycas, Thuja
9.	Pteridophytes	Campus	Nephrolepis

1. Green Cover of the college Campus

SN	Scientific Name	Common/local name	Habit	No. of Plants	Use
1	Cocculus hirsutus	Patalgarudi, Wasanvel	CLIMBER	15	treatment of fever, skin diseases, stomach disorders, urinary diseases and also as a sedative
2	Asparagus racemosus	Shatavari	CLIMBER	50	upset stomach (dyspepsia), constipation, stomach spasms, and stomach ulcers
3	Ipomoea cairica	Railway Creeper	CLIMBER	16	Antioxidant, anti-inflammatory, antiviral and highly potent against malaria.
4	Bignonia venusta	Golden Shower	CLIMBER	1	Treating white patches and infections on the skin (leukoderma, vitiligo).
5	Passiflora incaranta	Krushnkamal	CLIMBER	2	Treating digestive problems, including dyspepsia and diarrhoea; alternatively, it used as an astringent and expectorant for nervous conditions and spasms.

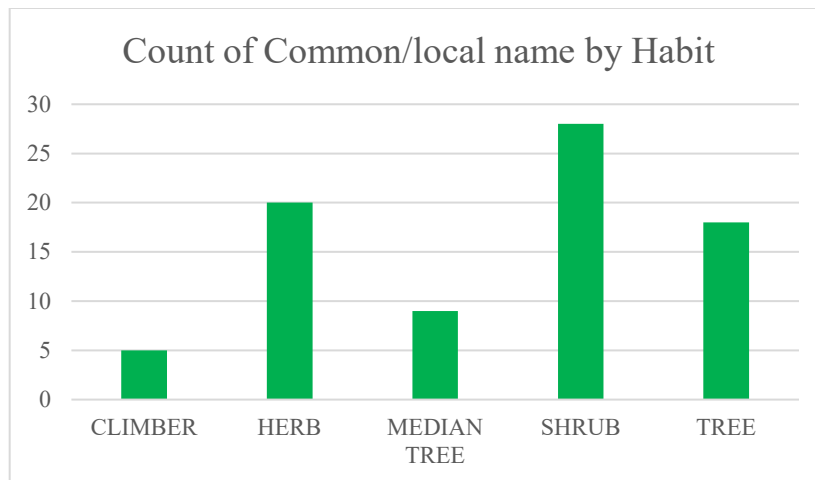
6	<i>Cassia tora</i>	Tarota	HERB	Many	Acrid, laxative, antiperiodic, anthelmintic, ophthalmic, liver tonic, cardio tonic and expectorant.
7	<i>Cleome viscosa</i>	Weed	HERB	Many	rheumatic arthritis, hypertension, malaria, neurasthenia, and wound healing
8	<i>Argemone mexicana</i>	Bilai, Paradi	HERB	Many	Tumors, warts, skin diseases, inflammations, rheumatism, jaundice, leprosy, microbial infections, and malaria.
9	<i>Euphorbia geniculata</i>	Dudhi	HERB	Many	Cancer, skin itches, leprosy, chicken pox, measles, asthma and ulcers.
10	<i>Ziziphus jujuba</i>	Bor	HERB	5	asthma, cough, and laryngitis, constipation, colitis and liver diseases, genitourinary system diseases
11	<i>Tridax procumbens</i>	Kambarmodi	HERB	Many	Wound healing and as an anticoagulant, antifungal, and insect repellent.
12	<i>Parthenium hysterophorus</i>	Gajargawat	HERB	Many	Remedy for skin inflammation, rheumatic pain, diarrhoea, urinary tract infections.
13	<i>Thespesia populnea</i>	Paras Pimpal	HERB	20	Antifertility, antibacterial, anti-inflammatory, antioxidant, purgative and hepatoprotective activity.
14	<i>Bauhinia sp</i>	Apta	HERB	Many	
15	<i>Hyptis suaveolens</i>	Jangli Tulas	HERB	Many	treat inflammation, gastric ulcer and infection
16	<i>Trichodesma zeylanicum</i>	Camel Bush	HERB	Many	Leaves and root infusion is used as a remedy for intestinal worms, coughing, itching and throat pain.
17	<i>Ocimum sanctum</i>	Tulas	HERB	Many	aiding cough, asthma, diarrhea, fever, dysentery, arthritis, eye diseases, indigestion, gastric ailments, etc

18	<i>Ageratum conyzoides</i>	Mahakua	HERB	Many	to treat fever, rheumatism, headache, colic, wounds caused by burns, dyspepsia, eye problem, uterine disorders and pneumonia
19	Aloe vera	Korfad	HERB	Many	Medicinal, Skin Problem, Cosmetic, Acidity, Stomach Related Problems
20	<i>Bryophyllum indicum</i>	Panfuti	HERB	10	eaten for diabetes, diuresis, dissolving kidney stones, respiratory tract infections, as well as applied to wounds, boils, and insect bites
21	<i>Symbopogon</i> sp	Gawati Chaha	HERB	2	antispasmodic, hypotensive, anticonvulsant, analgesic, antiemetic, antitussive, antirheumatic, antiseptic and treatment for nervous and gastrointestinal disorders and fevers.
22	<i>Heliconia rostrata</i>	Fishtail	HERB	12	cure jaundice, intestinal pain and hypertension
23	<i>Lilium indicum</i>	Lily	HERB	8	heart problems including heart failure and irregular heartbeat
24	<i>Hymenocallis littoralis</i>	Spider Lily	HERB	6	wound healing. To treat blemishes and freckles the plant is used as folk remedy.
25	<i>Tegetes erecta</i>	Piwala Zendu	HERB	20	Ornamental
26	<i>Cassia siamea</i>	Kassod	MEDIAN TREE	2	Typhoid, jaundice, abdominal pain, menstrual pain
27	<i>Alstonia scholaris</i>	Saptaparni	MEDIAN TREE	8	Rheumatism, leprosy, diarrhoea, tuberculosis,
28	<i>Pongamia pinnata</i>	Karanj	MEDIAN TREE	15	Rheumatism, Cough, Skin Disease
29	<i>Butea monosperma</i>	Palas	MEDIAN TREE	2	Astringent antidiarrheal antidyenteric febrifuge aphrodisiac purgative anthelmintic
30	<i>Thuja occidentali</i>	Thooja	MEDIAN TREE	10	Ornamental
31	<i>Acacia leucofholoea</i>	Hewar	MEDIAN TREE	5	astringent, a bitter, a thermogenic, a styptic, a preventive of infections

32	<i>Leucaena leucocephala</i>	Subabhul	MEDIAN TREE	20	stomach diseases, facilitate abortion and provide contraction, and it is often used as an alternative, complementary treatment for diabetes
33	<i>Ficus hispida</i>	Fig	MEDIAN TREE	8	inducing purgation and emesis to remove excess pitta dosha from the body.
34	<i>Peltophorum pterocarpum</i>	Sonmohor	MEDIAN TREE	2	Ornamental
35	<i>Bauhinia variegata</i>	Kanchan	SHRUB	5	antibacterial, antidiabetic, analgesic, anti-inflammatory, anti-diarrheal, anticancerous, nephroprotective and thyroid hormone regulating
36	<i>Bougainvillea glabra</i>	Booganvel	SHRUB	6	Stomach aches, inflammation and as an antiseptic. It's also been used to treat diabetes, high blood pressure, and high cholesterol.
37	<i>Nyctanthes arbor-tristis</i>	Parijatak	SHRUB	2	Anti-helminthic and anti-pyretic besides its use as a laxative, in rheumatism, skin ailments and as a sedative.
38	<i>Dalbergia sissoo</i>	Sisam	SHRUB	3	Furniture, musical instruments, decorative items and veneers.
39	<i>Nerium indicum</i>	Kaner	SHRUB	3	Ornamental
40	<i>Murraya koenigii</i>	Kadi patta	SHRUB	5	treating piles, inflammation, itching, fresh cuts, dysentery, bruises, and edema
41	<i>Tabernaemontana divaricate</i>	Swastik	SHRUB	2	hypertension, headaches, scabies, and toothaches
42	<i>Psidium guajava</i>	Jambh	SHRUB	2	inflammation, diabetes, hypertension
43	<i>Punica granatum</i>	Annar	SHRUB	1	treat sore throats, coughs, urinary infections
44	<i>Thevetia nerifolia</i>	Bitti	SHRUB	10	Ornamental
45	<i>Cassia fistula</i>	Bahawa	SHRUB	6	Treatment of inflammatory swellings and as a cleaning agent for ulcers and wounds.

46	<i>Tecoma stans</i>	Tecoma	SHRUB	5	Diabetes and stomach pains; a strong leaf and root decoction is taken orally as a diuretic, to treat syphilis or for intestinal worms.
47	<i>Hibiscus rosasinensis</i>	Jaswand	SHRUB	10	Ornamental
48	<i>Caesalpinia pulcherrima</i>	Chhota gulmohar	SHRUB	1	Ornamental
49	<i>Hamelia patens</i>	Hamelia	SHRUB	1	Ornamental
50	<i>Dyopsis lutescens</i>	Areca palm	SHRUB	2	Ornamental
51	<i>Plumeria rubra</i>	Chafa	SHRUB	2	anti-inflammatory, antioxidant, hepatoprotective and antimicrobial activities
52	<i>Annona squamosa</i>	Sitafal	SHRUB	3	Vomiting, Tumours
53	<i>Annona reticulata</i>	Ramfal	SHRUB	1	Vomiting, Tumours
54	<i>Lantena camara</i>	Raimoni	SHRUB	Many	Cancer, skin itches, leprosy, chicken pox, measles, asthma and ulcers.
55	<i>Jatropha curcas</i>	Ratnajyoti	SHRUB		Bacterial and fungal infections or febrile diseases, muscle pain or jaundice.
56	<i>Celastrus paniculatus</i>	Jyotishmati, Black Oil Plant, Bharati	SHRUB	86	Sciatica, Amnesia, Leprosy (Juzaam), Pneumonia, Pleurisy, Anaemia (Su -al-Qiniya)
57	<i>Glirisedia sepium</i>	Gliricidia	SHRUB	2	alopecia, boils, bruises, burns, colds, cough, debility, eruptions, erysipelas, fever
58	<i>Abutilon indicum</i>	Indian mallow	SHRUB	Many	laxative, emollient, analgesic, anti-diabetic, anti-inflammatory and blood tonic agent and also in the treatment of leprosy, urinary disease, jaundice, piles
59	<i>Calatropis procera</i>	Rui, Ruchki	SHRUB	Many	Antidote for snake bite, sinus fistula, rheumatism, mumps, burn injuries, and body pain.
60	<i>Yucca sp</i>	Adam's needle	SHRUB	4	Ornamental
61	<i>Ixora chinensis</i>	Jungle Flame	SHRUB	9	As an astringent and to treat dysentery and tuberculosis.
62	<i>Thuja occidentalis</i>	Vidya	SHRUB	28	respiratory tract infections such as bronchitis

63	<i>Ficus benghalensis</i>	Wad	TREE	1	Wound, skin diseases, leucorrhoea, diabetes, diarrhoea etc
64	<i>Ficus religiosa</i>	Pimpal	TREE	1	Cough, skin diseases, vomiting, nausea, sexual potency, diarrhoea
65	<i>Delonix regia</i>	Gulmohar	TREE	2	Chronic fever, constipation, piles, arthritis, pyorrhoea, asthma etc
66	<i>Tamarindus indica</i>	Chinch	TREE	1	Malaria, dysentery, abdominal pain, respiratory problems etc.
67	<i>Tectona grandis</i>	Teak (Saag)	TREE	2	Piles, leukoderma, dysentery
68	<i>Azadirachta indica</i>	Neem	TREE	3	Antifungal, constipation, malaria, detoxification, boosting immunity
69	<i>Kigelia pinnata</i>	Zumber	TREE	3	Wound, abscesses, ulcers, rheumatism
70	<i>Bombax ceiba</i>	Katesawar	TREE	3	Diarrhoea, constipation, piles, Urinary disorder,
71	<i>Polyalthia longifolia</i>	Chota ashok	TREE	12	fever, helminthiasis, diabetes and various cardiac problems
72	<i>Cycas pectinata</i>	Cycas	TREE	4	Ornamental
73	<i>Pithecellobium dulce</i>	English chinch	TREE	1	treat gum ailments, toothache and bleeding
74	<i>Albezia lebbek</i>	Shiras	TREE	2	Jaundice, fever and as a purgative for intestinal worms.
75	<i>Emblica officinalis</i>	Awala	TREE	2	immunomodulatory, anti-inflammatory
76	<i>Aegle marmelos</i>	Bel	TREE	1	Fever, Stomach related problems, treat tuberculosis
77	<i>Acacia nilotica</i>	Babhul	TREE	10	human immunodeficiency virus, hepatitis C virus and cancer
78	<i>Ficus glomerusa</i>	Umbar, Audumbar	TREE		dysentery, spongy gums, ulcers, diabetes, asthma
79	<i>Terminalia belirica</i>	Chinch	TREE	1	protect the liver and to treat respiratory conditions
80	<i>Pterospermum acerifolium</i>	Mujkund	TREE	1	inflammation, abdominal pain, ascites, cures ulcers



D. Biodiversity and threatened / endangered species preservation

1. Seed Ball Campaign

This is very unique campaign organized by the NSS unit in association with Department of Botany for the protection of biodiversity of surrounding environment as well as wild species of the local forest. In this campaign, Seeds of wild, economically, ecologically important plants were collected during month of late April and upto the mid of May and these seeds were properly dried under the sun. With the mixture of cow dung, fertile humus rich soil, water and vermicompost has been made. Randomly seeds of wild plants were mixed with mud balls and ultimately Seeds Balls has been created. These Seed Balls sun dried immediately. Dried seed balls now have some seeds within it. These seed balls distributed amongst the dedicated student of green army and advised to throw them randomly into the wild. It has been found that many plants have been developed on the onset of the monsoon season.



Wild Plant Seeds Collected



Mud Paste mixing with wild plant seeds



Preparation of seed Balls



Seed Balls Wet Conditions Coated with cow dung & Sundried Seed Balls



Ready to go into the wild, Germination of Seeds within the Seed Ball

2. “Bird’s Water & Feed Station”

During onset of summer season temperature around get elevated upto 45°C and this is very dangerous conditions for not only humans but also for birds and other creatures. Students of the college has created Bird Water and Feed Station from unused tin barrels of oil. These cans were molded and designed in such a way that they could have birds feed and water filled in it. This nest station also provides excellent landing site specially for birds which make them easy to access food and water. Bird’s Water & Feed Station have been fitted at 20 different places in the college premises under the shade conditions. All the students of the college along with the teaching and non-teaching staff are requested to fill water regularly in these nests along with their food. Since then, it has been observed that many bird species are regularly visiting these nest and feed station.





NSS Students involved in Bird's Water and Feed Station Preparation

E. Noise Pollution

The College has only one entry gate for the all Students, Teachers and Non-teaching staff to enter in the college premises. College authority has appointed well trained security guard for college and this appointed security guard along with the physical director of the college insures safe, smooth and noise free entry of the students and working personals of the college. As college is located on Maharashtra State Highway No -237, front road has very heavy traffic prone to noise pollution during pick hours of the day. To overcome this problem, the front side of the college towards State Highway Road has been intentionally planted with the trees which can absorbs noise as much as possible.

SN	NAME OF THE TREES AT COLLEGE FRONT FENSING	NUMBER
1.	<i>Polyanthia longifolia</i>	28
2.	<i>Bombax ceba</i>	05
3.	<i>Delonix regia</i>	10
4.	<i>Techtona grandis</i>	05
5.	<i>Pongamia pinnata</i>	16
5.	<i>Ficus bengolensis</i>	01
6.	<i>Casia fistula</i>	10
7.	<i>Tamarindus indica</i>	01

F. Air Pollution

1. “Green Army” for Environment protection

College has long term commitment for the environment protection and creating awareness among the society using college resources specially with the college students (Youth). College has created a special team of dedicated students and teachers in the form of Green Army. The students registered their names in the green army and worked for nature and society.



Students of Green Army busy in doing environment protection work

2. Tree Plantation Campaign in College Campus (Yearly)

SN	YEAR OF PLANTATION	NUMBER
1	2019	150
2	2020	100
3	2021	130

3. Oxygen Rich Zones in College Campus

There were 4 oxygen rich zones have been considered in the college premises on the basis of plants located in that particular area. They area as follows.

SN	AREA	Plants
1	College Botanical Garden	Adulsa, Asparagus, Cyanadon Grass, Arica Palm, Heliconia, Himelia, Cycus, Techoma, Water Lily, Spider Lily, Echornia, Pistia etc. Tulsi, Pimpal, Ficus, Pongamia Pinnata
2	Administrative Building	Ashoka, Euphorbia, Thuja, Ficus, Amaltas, Kijelia Pinnata etc
3	Area around Commerce Classroom	Alstonia, Ashoka, Euphorbia, Thuja, Ficus

4	Cycle Stand Towards College Canteen	Pongamia, Boganvelia, Ashoka, Euphorbia, Thuja, Ficus
5	Commerce Department	Pongamia, Amaltash, Shiras, Cherry

4. Awareness Program for college Students, Teacher & Staff

Special awareness program like “Donate RED, Spread GREEN, Save BLUE” has been organized by the NSS Unit of the college to create awareness about the environment protection and its sustainability



Donate RED, Spread GREEN, Save BLUE Campaign

5. “No Smoking” College Campus

To avoid or eliminate air pollution from the college campus, warning boards/ banners has been displayed at the college campus.





“No Smoking” Warning board displayed in the college corridor as a warning sign for students as well as whole college staff members

6. No Vehicle Day

No Vehicle Day has been celebrated throughout the academic year to reduce air pollution in and around college campus. This “No Vehicle Day” is organized on Thursday of every first week Month during whole year. It has been made mandatory for all to come without any vehicle in the college campus like car, motor-bikes except cycles. bicycles. The intention behind this activity to create awareness amongst the students, college staff and peoples of Dhamangaon Rly.

No Vehicle Day



No Vehicle Day in the College Campus

7. Pollution Checkup Using PUC Document

Staff Members and students owning vehicles are advised to check their vehicles for pollution norms and keep your PUC document upto date so as to check air pollution in the college campus.

8. Eco - Ventilators and Exhaust fans in the College laboratories

All the departments of the college are well ventilated and aerated so students can get adequate fresh air supply during their practical. At the same time some departments of the college are fitted with exhaust fans to eliminate hazardous fumes and air released during chemical reactions.

9. Periodic rallies and road shows in the Dhamangaon City

NSS/NCC Units of the college actively remain engaged with the students to arrange different rallies, 'Pathanaty' to create awareness among the society about the serious causes of the pollution.

G. Campus Cleanliness & Sanitization

Special Campus cleanliness drive has been periodically arranged by different departments of the college like NSS / NCC units for campus cleanliness and sanitization purpose. Students of NSS have made dust beans from disposed oil barrels and distributed to all classrooms and departments to collect all kind of waste material at one place. College Overhead Tanks has been periodically cleaned by sweepers so as to make sure that all departments, students and research laboratories getting clean water for their daily use.



SUGGESTIONS AND RECOMMENDATIONS

Water Management

The water sources are safe in terms of contamination. The students are taking back the food waste as per the zero waste management strategy of the college. It helped in reducing the consumption of water for washing.

The wells can be recharged with rainwater from rooftops of new building. The rain water can be harvested from the roof area of new building.

The Environmental club can arrange awareness programmes for water conservation. There should be a proper monitoring of water consumption pattern in the campus.

The canteen waste can also be subjected to aerobic composting by setting-up of few composting yards in the campus. This will provide a chance for the students to learn by seeing and operating such compost yards by themselves. Also a good practice of managing their own waste (from lunch box) instead of carrying them back home they can be trained in operating the compost yard ,by using their lunch time waste to produce good organic manure

Energy management

The energy audit recommend to avoid the use of more energy consuming electrical appliances and to replace with more environment friendly and energy efficient appliances (for example five stars rated Air conditioner) in the college. The potential of renewable energy sources have to be explored. As the college has a very large roof area for installing solar panels so that it can be effectively used for generating power. It is recommended to install the following solar powered appliances in the campus; Solar powered water heater and cooker in the college canteen Solar powered street lights and LED display board

Green Campus

In order to increase the carbon credit and greenery of the campus, it is recommended to plant more indigenous and evergreen / fruit trees inside the campus.

Waste Management

Try to avoid the use of plastic in the campus, and to encourage the use of biodegradable materials as alternatives. Try to achieve the goal of plastic free campus. Leaf litter from the campus can be effectively used for vermi composting, so that the composted material can also be used as good manure.

Recycle the paper waste instead of incinerate or burning.

Energy Audit Report

(2021 – 22)

For

Dhamangaon Education Society's

Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya,

Dhamangaon Railway, Dist: Amravati



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Preface

Data collection for energy audit of the Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya, Dhamangaon Rly was conceded by the team for the period of April 2021 to March 2022.

This audit was over sighted to inquire about convenience to progress the energy competence of the campus. All data collected from each classroom, laboratory etc. The work is completed by considering how many tubes, fans, A. Cc., electronic instruments, etc. in each room and their participation in total electricity consumption.

The objective of the audit was to study the energy consumption pattern of the facility, identify the areas where potential for energy saving exists and prepare proposals for energy saving along with investment with payback periods.

Acknowledgement

We are very much thankful to principal, Dr. Y. B. Gandole and IQAC coordinator, Dr. A. G. Naranje for motivating us and giving us the opportunity for energy audit. We would like to express our sincere thanks to all the faculties and staff members from each department for providing us necessary information and data for this audit survey.

Introduction

The objective of Energy Audit is to balance the total energy inputs with its use and to identify the energy conservation opportunities in the stream. It may include a process or system to reduce the amount of energy input into the system without negatively affecting the output.

The energy demand in every institution is growing day by day for to meet the international level comfort. This is challenge for every institution to ensure that energy growth in institute does not become unmanageable. As natural resources are limited and energy uses are increasing very sharply so it is very necessary to save natural resources by reducing energy consumption which can be achieved by using energy efficient equipment's and also by awareness of peoples about energy conservation.

In this energy audit survey, we collected data from every department and then find out the energy consumption in each department. The power consumption is calculated by considering the consumption of various devices such as tube lights, CFL bulbs, LED bulbs, fans, A. Cs. practical laboratory equipment's etc. from each department. The scope for energy conservation is found out by replacing the equipment's with equivalent energy efficient equipment's. The data generated in energy audit are useful for to understand the energy distribution and utilization of the college.

Department wise Energy Requirement:

1) Department of Physics

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tubelight (F)	40	4	4	640
2	LED Tubelight	20	4	4	320
3	CFL bulb	24	2	4	192
4	Ceiling Fans	60	9	3	1620
5	Cooler	300	1	0.5	150
6	PC (LED monitor)	60	3	1	180
7	Printer	500	2	0.2	200
8	Scanner	12	1	0.5	6
9	LCD Projector	300	1	0.5	150
10	Refrigerator (185 L)	1.5 KWHr/day	1	24	1500
11	Lab equipments for practicals	300	10	2	6000
	Total				10958
	Power Requirements in one day				10.96 unit
	Average Power requirement in one year				4000.4 units
	Average power requirement in one month				333.37 units
	Remarks :				
1)	Replacement of Old electric fittings.				
2)	3 -phase connection for furnace and water distillation plant is taken from microbiology lab. Separate 3-phase connection should be provided to avoid power load				

2) Department of Computer Science

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tubelight (F)	40	11	5	2200
2	Exhaust Fan	60	3	2	360
3	Ceiling Fans	60	8	4	1920
4	PC (LED monitor)	60	12	3	2160
5	Laptop	50	1	2	100
6	Printer	500	3	0.5	750
7	LCD Projector	300	2	2	1200
	Total				8690
	Power Requirements in one day				8.69 unit
	Average Power requirement in one year				3171.85 units
	Average power requirement in one month				264.32 units
	Remarks:				
1)	Replacement of conventional light by LED tubelights.				
2)	Replacement of monitors				

3) Department of Chemistry

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tubelight (F)	40	11	4	1760
2	CFL light	22	1	4	88
3	Exhaust Fan	60	2	0.5	60
4	Ceiling Fans	60	6	4	1440
5	Wall Fan	40	2	4	320
6	PC (LED monitor)	60	4	2	480
7	Scanner	12	1	1	12
8	Printer	500	1	0.5	250
9	LCD Projector	300	1	0.5	150
10	Refrigerator	2 KWHr/Day	1	24	2000
11	Electric Ovens	1000	2	0.25	500
12	Practical Instruments	100	12	0.5	600
	Total				7660
	Power Requirements in one day				7.66 unit
	Average Power requirement in one year				2795.9 unit
	Average power requirement in one month				233 unit
	Remarks:				
1	Replacement of electric wiring.				

4) Department of Electronics

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tubelight (F)	40	3	1	120
2	LED Tubelight	20	2	2	80
3	CFL bulb	24	1	1	24
4	Ceiling Fans	60	2	1	120
5	Tabel Fan	40	1	1	40
6	PC (LED monitor)	60	3	2	360
7	Laptop	50	2	1	100
8	Printer	500	1	0.25	125
9	LCD Projector	300	1	0.5	150
10	Cooler	250	1	0.5	125
11	Practical equipments				150
	Total				1394
	Power Requirements in one day				1.394 unit
	Average Power requirement in one year				508.81 units
	Average power requirement in one month				42.4 units
	Remarks:				
1.	Replacement of Old electric fitting.				

5) Department of Microbiology

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tubelight (F)	40	11	4	1760
2	Ceiling Fans	60	6	4	1440
3	Wall Fan	40	2	4	320
4	Exhaust Fan	60	2	5	600
5	Cooler	300	1	0.5	150
6	PC (LED monitor)	60	3	1	180
7	Scanner	12	1	1	12
8	Printer	500	1	0.2	100
9	LCD Projector	300	2	1	600
10	Refrigerator	2 KWHr/Day	3	24	6000
11	Electric Ovens	1750	2	1	3500
12	Incubator	0.25 KW/Hr	4	24	12000
13	BOD Incubator	0.25 KW/Hr	1	24	3000
14	Autoclave	2500	3	1	7500
15	Laminar Air flow	1000	1	0.02	20
	Total				37182
	Power Requirements in one day				37.18 unit
	Average Power requirement in one year				13570.7 unit
	Average power requirement in one month				1130.89 unit
	Remarks:				
1.	Two fans and two tube lights are not working.				

6) Department of Zoology

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tubelight (F)	40	8	3	960
2	LED tubelight	20	2	3	120
3	Ceiling Fans	60	7	3	1260
4	PC (LED monitor)	60	1	1	60
5	Printer	500	1	0.1	50
6	LCD Projector	300	1	0.2	60
7	Refrigerator	2 KWHr/Day	1	24	2000
8	Electric Ovens	1000	2	0.1	200
9	Autoclave	3000	1	0.05	150
10	Laminar flow hood	500	1	0.05	25
11	Centrifuge	150	1	0.05	7.5
12	Bact. Incubator	150	1	0.05	7.5
	Total				4900
	Power Requirements in one day				4.9 unit
	Average Power requirement in one year				1788.5 unit
	Average power requirement in one month				149.04 unit

7) Department of Mathematics

Sr. No.	Name of the Appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tubelight (F)	40	1	4	160
2	CFL bulb	24	1	2	48
3	Ceiling Fans	60	1	4	240
4	OHP	300	1	0.5	150
5	PC (LED monitor)	60	1	2	120
6	Laptop	50	1	2	100
7	Printer	500	1	0.5	250
8	LCD Projector	300	1	1	300
9	Cooler	300	1	0.5	150
	Total				1518
	Power Requirements in one day				1.518 unit
	Average Power requirement in one year				554.07 units
	Average power requirement in one month				46.17 units

8) Department of Botany

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light (F)	40	8	5	1600
2	Ceiling Fans	60	5	4	1200
3	PC (LCD monitor)	60	1	0.5	30
4	PC (CRT monitor)	100	1	1	100
5	Laptop	50	1	3	150
6	Printer	500	1	0.5	250
7	LCD Projector	300	1	1	300
8	Refrigerator	1.5 KWHr/Day	1	24	1500
9	Electric Ovens	1000	1	0.1	100
10	Autoclave	1000	1	0.1	100
11	Electric Heater	1000	1	0	0
12	Spectrophotometer	500	1	0.1	50
13	Inverter	1000	1	0.5	500
	Total				5880
	Power Requirements in one day				5.88 unit
	Average Power requirement in one year				2146.2 unit
	Average power requirement in one month				178.85 unit
	Remarks:				
1	Electric feeting repairing is urgent requirement				
2	Proper earthing is not present				
3	Two more ceiling fans are required				
4	Three more electric boards are required				
5	One desktop PC is required to replace CRT				

9) Department of Commerce

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	CFL light	24	2	3	144
2	LED light	20	6	1	120
3	Ceiling Fans	60	5	4	1200
4	PC (LED monitor)	60	19	3	3420
5	Laptop	50	4	4	800
6	Printer	500	2	0.5	500
7	LCD Projector	300	1	1	300
	Total				6484
	Power Requirements in one day				6.48 unit
	Average Power requirement in one year				2365.2 unit
	Average power requirement in one month				197.1 unit

10) Department of English

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tubelight	40	4	1	160
2	Ceiling Fans	60	4	1	240
3	PC (LED monitor)	60	10	1	600
4	Printer	500	1	0.25	125
	Total				1250
	Power Requirements in one day				1.25 unit
	Average Power requirement in one year				456.25unit
	Average power requirement in one month				38.02 unit
	Remarks:				
1.	Two tube lights are not in working condition.				

11) Department of social sciences and Humanities

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	CFL bulb	24	1	5	120
2	Ceiling Fans	60	1	5	300
	Total				420
	Power Requirements in one day				0.42 unit
	Average Power requirement in one year				153.3 unit
	Average power requirement in one month				12.78 unit
	Remarks:				
1	Required two more lights and fans.				

12) Library

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tubelight	40	20	3	2400
2	CFL light	24	4	2	192
3	LED light	20	10	3	600
4	Ceiling Fans	60	19	2	2280
5	Exhaust Fan	60	1	5	300
6	PC (LED monitor)	60	8	4	1920
7	Printer	500	2	0.5	500
8	Xerox machine	1200	1	4	4800
9	Coolers	300	2	1	600
10	Water cooler	575	1	0	0
	Total				13592
	Power Requirements in one day				13.59 unit
	Average Power requirement in one year				4960.35 unit
	Average power requirement in one month				413.36 unit

13) Department of Physical Education, Indoor stadium, NSS office

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	CFL light	24	4	5	480
2	Ceiling Fans	60	4	3	720
3	PC (LED monitor)	60	1	1	60
4	Printer	500	1	0.5	250
	Total				1510
	Power Requirements in one day				1.51 unit
	Average Power requirement in one year				551.15 unit
	Average power requirement in one month				45.93 unit

14) Health Center, NCC office

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	9	5	1800
2	Ceiling Fans	60	2	5	600
	Total				2400
	Power Requirements in one day				2.4 unit
	Average Power requirement in one year				876 unit
	Average power requirement in one month				73 unit

15) Administration office, Cabin

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tubelight	40	6	6	1440
2	LED light	20	3	6	360
3	CFL	24	3	6	432
4	Ceiling Fans	60	7	5	2100
5	Wall Fan	40	1	5	200
6	PC (LED monitor)	60	8	3	1440
7	Printer	500	4	0.5	1000
8	A.C.	1000	1	5	5000
9	Coolers	300	1	1	300
	Total				12272
	Power Requirements in one day				12.27unit
	Average Power requirement in one year				4478.55 unit
	Average power requirement in one month				373.21 unit

16) IQAC

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tubelight	40	1	3	120
2	CFL	24	4	2	192
3	Ceiling Fans	60	6	1	360
4	PC (LED monitor)	60	1	1	60
5	Printer	500	1	0.25	125
6	Cooler	300	1	0.5	150
	Total				1007
	Power Requirements in one day				1 unit
	Average Power requirement in one year				365 unit
	Average power requirement in one month				30.42 unit

17) Seminar Hall

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tubelight	40	10	1	400
2	Ceiling Fans	60	7	1	420
3	Laptop	50	1	0.5	25
4	LCD Projector	300	1	0.5	150
5	Sound system	200	1	0.5	100
	Total				1095
	Power Requirements in one day				1.1 unit
	Average Power requirement in one year				401.5 unit
	Average power requirement in one month				33.46 unit

18) Staff room

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tube light	40	2	6	480
2	Ceiling Fans	60	2	6	720
3	Cooler	300	1	1	300
4	RO system	100	1	5	500
5	Water cooler	2.5 KW.Hr/day	1	24	2500
	Total				4500
	Power Requirements in one day				4.5unit
	Average Power requirement in one year				1642.5 unit
	Average power requirement in one month				136.88 unit

19) Auditorium

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tube light	40	6	1	240
2	Ceiling Fans	60	7	1	420
3	Sound system	1000	1	0.2	200
	Total				860
	Power Requirements in one day				0.86 unit
	Average Power requirement in one year				313.9 unit
	Average power requirement in one month				26.16 unit

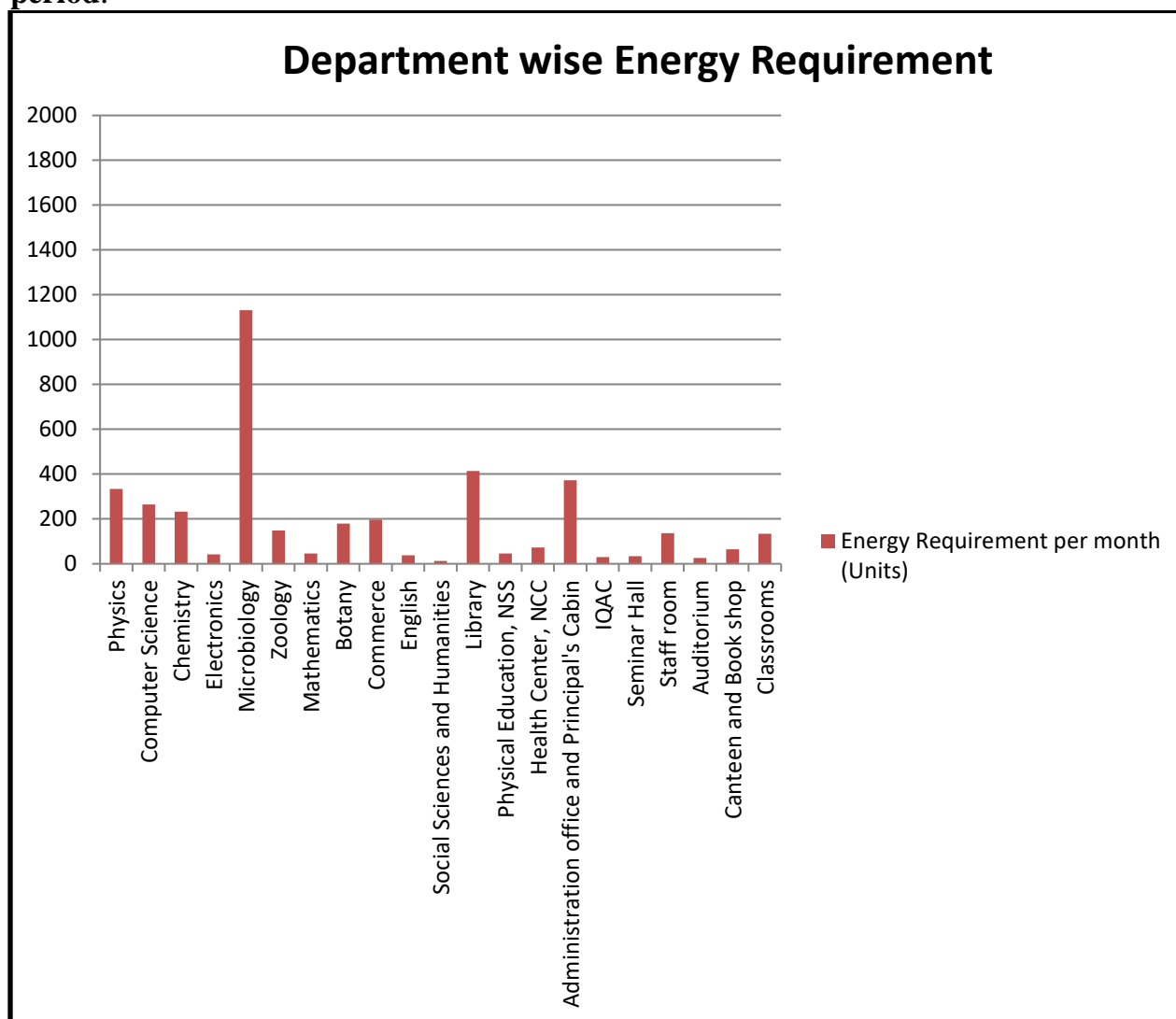
20) Canteen and Bookshop

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tube light	40	3	3	360
2	Ceiling Fans	60	2	3	360
3	Xerox Machine	1200	1	1	1200
4	Wall Fan	40	1	2	80
5	PC	60	1	2	120
	Total				2120
	Power Requirements in one day				2.12unit
	Average Power requirement in one year				773.8 unit
	Average power requirement in one month				64.48 unit

21) Classrooms

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	4	1	160
2	LED	20	25	1	500
3	Ceiling Fans	60	30	2	3600
4	Wall fan	40	2	2	160
	Total				4420
	Power Requirements in one day				4.42 unit
	Average Power requirement in one year				1613.3 unit
	Average power requirement in one month				134.44 unit

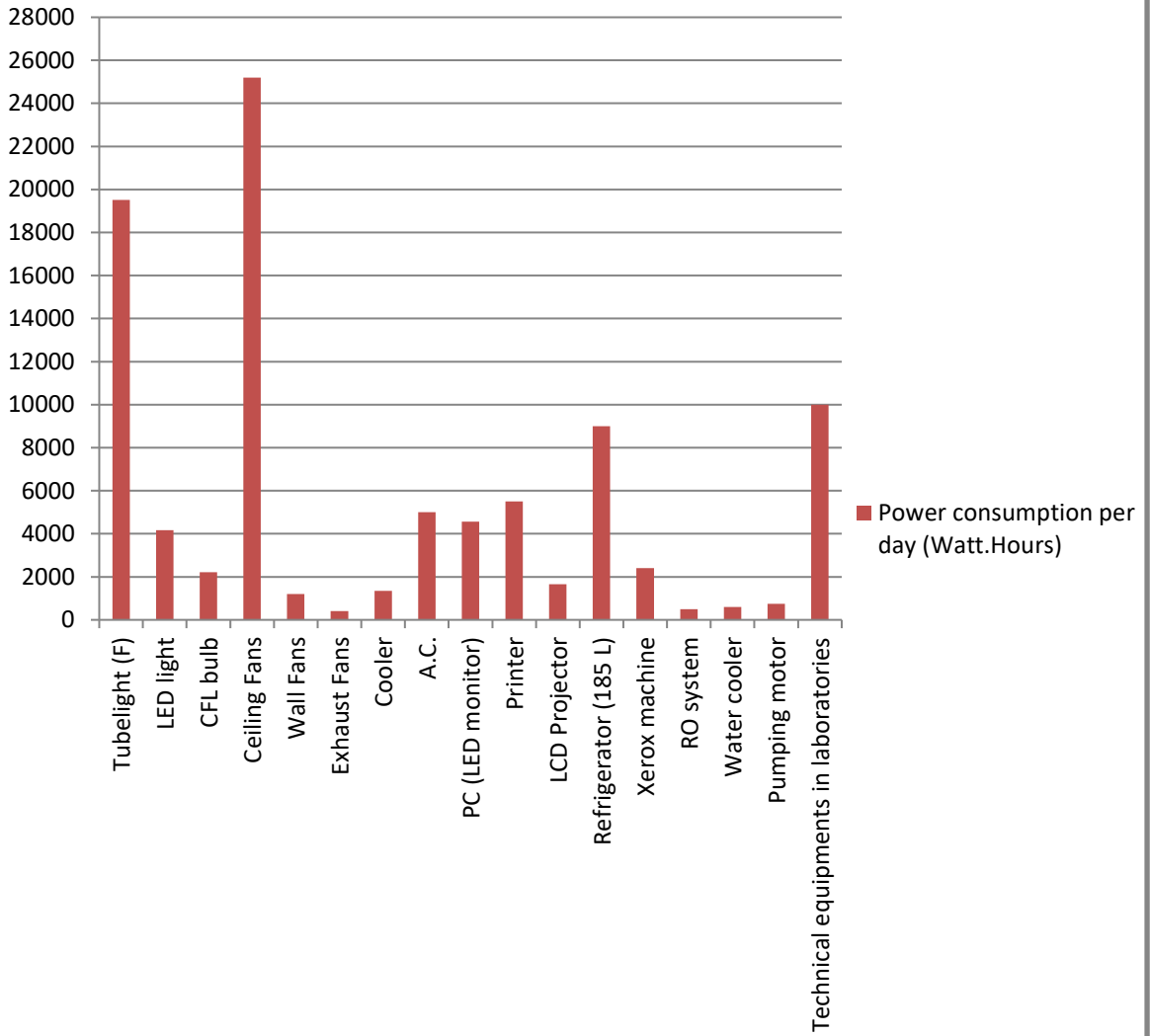
Note: This is total load consumption considered approximately. Actual load consumption might be different according to actual use of power for particular time period.



Equipment wise Energy Consumption:

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tubelight (F)	40	122	4	19520
2	LED light	20	52	4	4160
3	CFL bulb	24	23	4	2208
4	Ceiling Fans	60	140	3	25200
5	Wall Fans	50	8	3	1200
6	Exhaust Fans	50	8	1	400
7	Cooler	300	9	0.5	1350
8	A.C.	1000	1	5	5000
9	PC (LED monitor)	60	76	1	4560
10	Printer	500	22	0.5	5500
11	LCD Projector	300	11	0.5	1650
12	Refrigerator (185 L)	1 KWHr/day	9	24	9000
13	Xerox machine	1200	1	2	2400
14	RO system	100	1	5	500
15	Water cooler	2.5 KW.Hr/day	1	6	600
16	Pumping motor	746	1	1	746
17	Technical equipments in laboratories				10000
	Total				93994
	Energy consumed in one day = 94 unit				
	Average Energy consumption in one year = 34310 units				
	Average Energy consumption in one month = 2859 units				

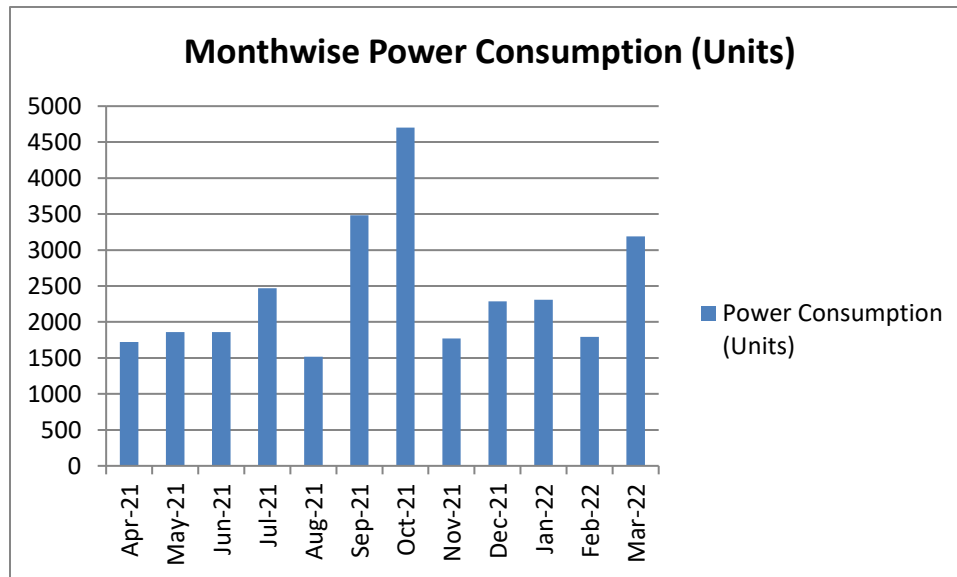
Equipment wise Power consumption per day (Watt.Hours)



Month wise Energy Consumption:

Month	Power Consumption (Units)
Mar-22	3189
Feb-22	1794
Jan-22	2311
Dec-21	2287
Nov-21	1773
Oct-21	4702
Sep-21	3483
Aug-21	1518
Jul-21	2467
Jun-21	1858
May-21	1861
Apr-21	1720
	28963

Average Energy Consumption in one month = 2414 units



Recommendations

- 1) Replace all conventional tube lights with LED tube lights, to save more power.
- 2) In Physics laboratory, 3 -phase connection for furnace and water distillation plant is taken from microbiology lab. Separate 3-phase connection should be provided to avoid power load
- 3) In old building, there is need to replace the electric boards and electric fitting.
- 4) Install solar plant to reduce electric bill.
- 5) Switch off Light, fans, P.Cs. and other electrical appliances whenever they are not in use.

Energy saving calculation:

- 1) If the conventional tube lights are replaced with LED tube light, a large amount of energy can be save.

Total number of conventional tube lights in college campus = 122

The average power of conventional tube light = 40 W

The average power of LED tube light = 20 W

Difference in power saved per tube light = $(40 - 20) = 20$ W

Total power saving = $122 \times 20 = 2440$ W

Let average use of each tube light per day = 4 Hours

Energy saved per day = $2440 \times 4 = 9760$ Watt.Hours = 9.76 KW.Hours = 9.76 units

Energy saved in one year = $9.76 \times 365 = 3562.4$ units

The reduction in electric bill in one year = $3562.4 \times 5.47 = 19486/-$ Rs

Average cost of single LED tube light = 400 Rs

Total cost of replacing all conventional tube lights = 48800 Rs

Pay back period required = $48800/19486 = 2.5$ Years

Estimate for installation of solar plant in college campus:

Department wise required power load:

S.N.	Department	Power Load (Watt)
1	Physics	2320
2	Computer Science	1870
3	Chemistry	2262
4	Electronics	1024
5	Microbiology	5592
6	Zoology	1840
7	Mathematics	534
8	Botany	1830
9	Commerce	1808
10	English	1000
11	Social Sciences and Humanities	84
12	Library	5576
13	Physical Education, NSS	396
14	Health Center, NCC	480
15	Administration office and Principal's Cabin	3612
16	IQAC	856
17	Seminar Hall	1070
18	Staff room	2600
19	Auditorium	660
20	Canteen and Book shop	1540
21	Classrooms	2540
	Total	39494

Total required power load = 40 kW

Note: While calculating power load, the technical instruments with high power rating (Furnace, incubator, oven etc) in Physics, Chemistry, Botany, Zoology and Microbiology departments are not taken into consideration.

Approximate expenditure required to install solar plant of 1 kW = Rs. 60,000/-

Approximate space required to install solar plant of 1 kW = 1 m²

The approximate units produced by solar plant of 1 kW per day= 4 units

The approximate units produced by solar plant of 1 kW in one year= 1460 units

Approximate Saving in electric bill in one year = Rs. 10,000/-

Payback period = 6 years

----- THE END -----

Energy Audit Report

(2020 – 21)

For

Dhamangaon Education Society's

Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya,

Dhamangaon Railway, Dist: Amravati



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Preface

Data collection for energy audit of the Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya, Dhamangaon Rly was conceded by the team for the period of April 2019 to March 2020.

This audit was over sighted to inquire about convenience to progress the energy competence of the campus. All data collected from each classroom, laboratory etc. The work is completed by considering how many tubes, fans, A. Cc., electronic instruments, etc. in each room and their participation in total electricity consumption.

The objective of the audit was to study the energy consumption pattern of the facility, identify the areas where potential for energy saving exists and prepare proposals for energy saving along with investment with payback periods.

Acknowledgement

We are very much thankful to principal, Dr. Y. B. Gandole and IQAC coordinator, Dr. A. G. Naranje for motivating us and giving us the opportunity for energy audit. We would like to express our sincere thanks to all the faculties and staff members from each department for providing us necessary information and data for this audit survey.

Introduction

The objective of Energy Audit is to balance the total energy inputs with its use and to identify the energy conservation opportunities in the stream. It may include a process or system to reduce the amount of energy input into the system without negatively affecting the output.

The energy demand in every institution is growing day by day for to meet the international level comfort. This is challenge for every institution to ensure that energy growth in institute does not become unmanageable. As natural resources are limited and energy uses are increasing very sharply so it is very necessary to save natural resources by reducing energy consumption which can be achieved by using energy efficient equipment's and also by awareness of peoples about energy conservation.

In this energy audit survey, we collected data from every department and then find out the energy consumption in each department. The power consumption is calculated by considering the consumption of various devices such as tube lights, CFL bulbs, LED bulbs, fans, A. Cs. practical laboratory equipment's etc. from each department. The scope for energy conservation is found out by replacing the equipment's with equivalent energy efficient equipment's. The data generated in energy audit are useful for to understand the energy distribution and utilization of the college.

Department wise Energy Requirement:

1) Department of Physics

Sr. No.	Name of the Appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light (F)	40	9	4	1440
2	CFL bulb	24	2	5	240
3	Ceiling Fans	80	6	6	2880
4	Cooler	300	1	0.5	150
5	PC (LED monitor)	60	3	3	540
6	Printer	500	2	0.2	200
7	Scanner	12	1	0.5	6
8	LCD Projector	300	1	0.5	150
9	Refrigerator (185 L)	1.5KWHr/day	1	1	1500
10	Lab equipment's for practical	300	10	2	6000
11	Microwave Oven	1400	1	0.1	140
12	Muffle Furnace	5000	2	0.1	1000
13	Water Distillation Plant	5000	1	0.1	500
	Total				14746
	Power Requirements in one day				14.746 unit
	Average Power requirement in one year				5382.29 units
	Average power requirement in one month				448.52 units
	Remarks:				
1.	Replacement of Old electric fittings.				
2.	3 -phase connection for furnace and water distillation plant is taken from microbiology lab. Separate 3-phase connection should be provided to avoid power load				

2) Department of Computer Science

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light (F)	40	11	6	2640
2	Exhaust Fan	60	3	2	360
3	Ceiling Fans	80	8	6	3840
4	PC (LED monitor)	60	12	3	2160
5	Laptop	50	1	2	100
6	Printer	500	3	0.5	750
7	LCD Projector	300	2	2	1200
	Total				11050
	Power Requirements in one day				11.05 unit
	Average Power requirement in one year				4033.25 unit
	Average power requirement in one month				336.1 unit

3) Department of Chemistry

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light (F)	40	11	6	2640
2	CFL light	22	1	6	132
3	Exhaust Fan	60	2	0.5	60
4	Ceiling Fans	80	6	4	1920
5	Wall Fan	40	2	4	320
6	PC (LED monitor)	60	4	2	480
7	Scanner	12	1	1	12
8	Printer	500	1	0.5	250
9	LCD Projector	300	1	0.5	150
10	Refrigerator	2 KWHr/Day	1	1	2000
11	Electric Ovens	1000	2	0.25	500
12	Practical Instruments	100	12	0.5	600
	Total				9064
	Power Requirements in one day				9.06 unit
	Average Power requirement in one year				3306.9 unit
	Average power requirement in one month				275.58 unit
	Remarks:				
1	Replacement of electric wiring.				

4) Department of Electronics

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light (F)	40	4	1	160
2	CFL bulb	24	1	1	24
3	Ceiling Fans	80	2	1	160
4	Tabel Fan	40	1	1	40
5	PC (LED monitor)	60	3	2	360
6	Laptop	50	2	1	100
7	Printer	500	1	0.25	125
8	LCD Projector	300	1	0.5	150
	Total				1119
	Power Requirements in one day				1.119 unit
	Average Power requirement in one year				408.44 unit
	Average power requirement in one month				34.04 unit
	Remarks:				
1.	Replacement of Old electric filltings.				

5) Department of Microbiology

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light (F)	40	11	5	2200
2	Ceiling Fans	80	6	5	2400
3	Wall Fan	40	2	4	320
4	Exhaust Fan	60	2	5	600
5	Cooler	300	1	0.5	150
6	PC (LED monitor)	60	3	1	180
7	Scanner	12	1	1	12
8	Printer	500	1	0.5	250
9	LCD Projector	300	2	2	1200
10	Refrigerator	2 KWHr/Day	4	24	8000
11	Electric Ovens	1750	2	1	3500
12	Incubator	0.25 KW/Hr	4	24	24000
13	BOD Incubator	0.25 KW/Hr	1	24	6000
14	Autoclave	2500	3	2	15000
15	Laminar Air flow	1000	1	0.02	20
	Total				63832
	Power Requirements in one day				63.83 unit
	Average Power requirement in one year				23297.95 unit
	Average power requirement in one month				1941.5 unit

6) Department of Zoology

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light (F)	40	10	3	1200
2	Ceiling Fans	80	7	3	1680
3	PC (LED monitor)	60	1	1	60
4	Printer	500	1	0.1	50
5	LCD Projector	300	1	0.2	60
6	Refrigerator	2 KWHr/Day	1	24	2000
7	Electric Ovens	1000	2	0.1	200
8	Autoclave	3000	1	0.05	150
9	Laminar flow hood	500	1	0.05	25
10	Centrifuge	150	1	0.05	7.5
	Total				5432.5
	Power Requirements in one day				5.43 unit
	Average Power requirement in one year				1981.95unit
	Average power requirement in one month				165.16unit

7) Department of Mathematics

Sr. No.	Name of the Appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light (F)	40	1	4	160
2	CFL bulb	24	1	2	48
3	Ceiling Fans	80	1	4	320
4	OHP	300	1	0.5	150
5	PC (LED monitor)	60	1	2	120
6	Laptop	50	1	2	100
7	Printer	500	1	0.5	250
8	LCD Projector	300	1	1	300
	Total				1448
	Power Requirements in one day				1.448 unit
	Average Power requirement in one year				528.52 unit
	Average power requirement in one month				44.04 unit

8) Department of Botany

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light (F)	40	8	6	1920
2	Ceiling Fans	80	5	5	2000
3	PC (LCD monitor)	60	1	0.5	30
4	PC (CRT monitor)	100	1	1	100
5	Laptop	50	1	3	150
6	Printer	500	1	0.5	250
7	LCD Projector	300	1	1	300
8	Refrigerator	1.5KWHr/Day	1	24	1500
9	Electric Ovens	1000	1	0.1	100
10	Autoclave	1000	1	0.1	100
11	Electric Heater	1000	1	0	0
12	Spectrophotometer	500	1	0.1	50
13	Inverter	1000	1	0.5	500
	Total				7000
	Power Requirements in one day				7 unit
	Average Power requirement in one year				2555 unit
	Average power requirement in one month				212.92 unit
	Remarks:				
1	Electric feeting repairing is urgent requirement				
2	Proper earthing is not present				
3	Two more ceiling fans are required				
4	Three more electric boards are required				
5	One desktop PC is required to replace CRT				

9) Department of Commerce

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	CFL light	24	4	3	288
2	LED light	20	1	1	20
3	Ceiling Fans	80	5	4	1600
4	PC (LED monitor)	60	19	3	3420
5	Laptop	50	1	4	200
6	Printer	500	2	0.5	500
7	LCD Projector	300	2	1	600
	Total				6628
	Power Requirements in one day				6.63 unit
	Average Power requirement in one year				2419.95unit
	Average power requirement in one month				201.66 unit

10) Department of English

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	Tube light	40	4	1	160
2	Ceiling Fans	80	4	1	320
3	PC (LED monitor)	60	10	2	1200
4	Printer	500	2	0.25	250
	Total				1930
	Power Requirements in one day				1.93 unit
	Average Power requirement in one year				704.45 unit
	Average power requirement in one month				58.7 unit

11) Department of social sciences and Humanities

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	$F = C \times D \times E$
1	CFL bulb	24	1	5	120
2	Ceiling Fans	80	1	5	400
	Total				520
	Power Requirements in one day				0.52 unit
	Average Power requirement in one year				189.8 unit
	Average power requirement in one month				15.82 unit
	Remarks:				
1	Required two more lights and fans.				

12) Library

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	26	3	3120
2	CFL light	24	4	2	192
3	LED light	20	4	3	240
4	Ceiling Fans	80	19	2	3040
5	Exhaust Fan	60	1	5	300
6	PC (LED monitor)	60	8	4	1920
7	Printer	500	2	0.5	500
8	Xerox machine	1200	1	4	4800
9	Coolers	300	2	1	600
10	Water cooler	575	1	0	0
	Total				14712
	Power Requirements in one day				14.71 unit
	Average Power requirement in one year				5369.15 unit
	Average power requirement in one month				447.43 unit

13) Department of Physical Education, Indoor stadium, NSS office

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	CFL light	24	4	5	480
2	Ceiling Fans	80	4	3	960
3	PC (LED monitor)	60	1	1	60
4	Printer	500	1	0.5	250
	Total				1750
	Power Requirements in one day				1.75 unit
	Average Power requirement in one year				638.75 unit
	Average power requirement in one month				53.23 unit

14) Health Center, NCC office

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	9	5	1800
2	Ceiling Fans	80	6	5	2400
	Total				4200
	Power Requirements in one day				4.2 unit
	Average Power requirement in one year				1533 unit
	Average power requirement in one month				127.75 unit

15) Administration office, Cabin

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	7	6	1680
2	LED light	20	4	6	480
3	Ceiling Fans	80	7	5	2800
4	Wall Fan	40	1	5	200
5	PC (LED monitor)	60	8	3	1440
6	Printer	500	4	0.5	1000
7	A.C.	1000	1	5	5000
8	Coolers	300	1	1	300
	Total				12900
	Power Requirements in one day				12.9 unit
	Average Power requirement in one year				4708.5 unit
	Average power requirement in one month				392.38 unit

16) IQAC

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	3	3	360
2	Ceiling Fans	80	3	3	720
3	PC (LED monitor)	60	1	1	60
4	Printer	500	1	0.25	125
5	Cooler	300	1	0.5	150
	Total				1415
	Power Requirements in one day				1.42 unit
	Average Power requirement in one year				518.3 unit
	Average power requirement in one month				43.19 unit

17) Seminar Hall

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	10	1	400
2	Ceiling Fans	80	7	1	560
3	Laptop	50	1	0.5	25
4	LCD Projector	300	1	0.5	150
5	Sound system	200	1	0.5	100
	Total				1235
	Power Requirements in one day				1.24 unit
	Average Power requirement in one year				452.6 unit
	Average power requirement in one month				37.72 unit

18) Staff room

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	2	6	480
2	Ceiling Fans	80	2	6	960
3	Cooler	300	1	1	300
4	RO system	100	1	5	500
5	Water cooler	2.5 KW.Hr/day	1	24	2500
	Total				4740
	Power Requirements in one day				4.74 unit
	Average Power requirement in one year				1730.1 unit
	Average power requirement in one month				144.18 unit

19) Auditorium

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	4	1	160
2	Ceiling Fans	80	4	1	320
3	Sound system	1000	1	0.2	200
	Total				680
	Power Requirements in one day				0.68 unit
	Average Power requirement in one year				248.2 unit
	Average power requirement in one month				20.68 unit

20) Canteen and Bookshop

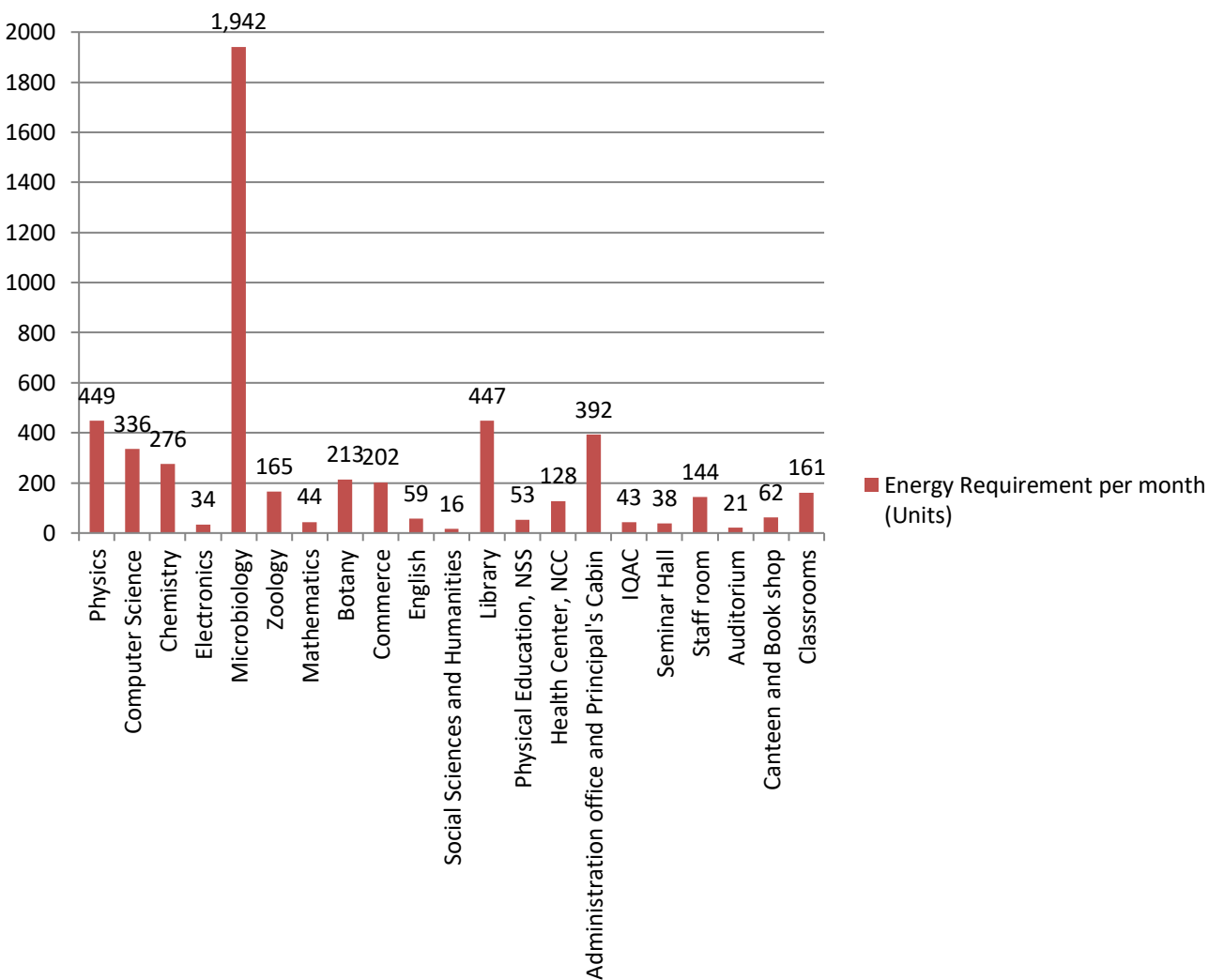
Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	3	3	360
2	Ceiling Fans	80	2	3	480
3	Xerox Machine	1200	1	1	1200
	Total				2040
	Power Requirements in one day				2.04 unit
	Average Power requirement in one year				744.6 unit
	Average power requirement in one month				62.05 unit

21) Classrooms

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tube light	40	10	2	800
2	Ceiling Fans	80	14	4	4480
	Total				5280
	Power Requirements in one day				5.28 unit
	Average Power requirement in one year				1927.2 unit
	Average power requirement in one month				160.6 unit

Note: This is total load consumption considered approximately. Actual load consumption might be different according to actual use of power for particular time period.

Department wise Energy Requirement

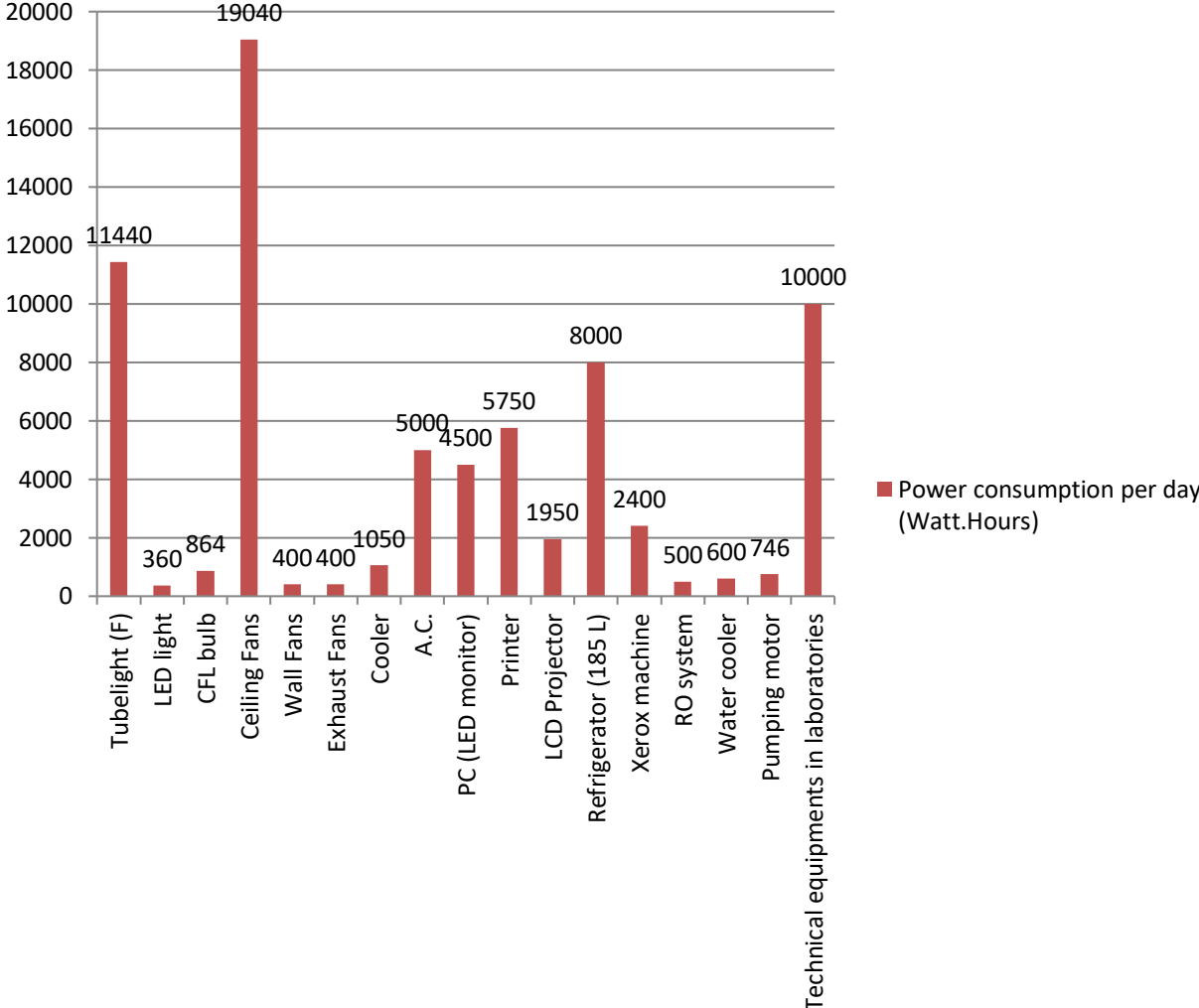


Equipment wise Energy Consumption:

Sr. No.	Name of the appliance	Power Rating (Watt)	Quantity	Average daily usage in hours	Power consumption per day (Watt.Hours)
A	B	C	D	E	F = C × D × E
1	Tubelight (F)	40	143	2	11440
2	LED light	20	9	2	360
3	CFL bulb	24	18	2	864
4	Ceiling Fans	80	119	2	19040
5	Wall Fans	50	4	2	400
6	Exhaust Fans	50	8	1	400
7	Cooler	300	7	0.5	1050
8	A.C.	1000	1	5	5000
9	PC (LED monitor)	60	75	1	4500
10	Printer	500	23	0.5	5750
11	LCD Projector	300	13	0.5	1950
12	Refrigerator (185 L)	1 KWHr/day	8	24	8000
13	Xerox machine	1200	1	2	2400
14	RO system	100	1	5	500
15	Water cooler	2.5 KW.Hr/day	1	6	600
16	Pumping motor	746	1	1	746
17	Technical equipments in laboratories				10000
	Total				73000
	Energy consumed in one day = 73 unit				
	Average Energy consumption in one year = 26645 units				
	Average Energy consumption in one month = 2220 units				

Note: Since during the academic session 2020 – 21 the college is remain closed for students due to covid – 19 pandemic, the actual power consumed is less as that of required power.

Equipment wise Power consumption per day (Watt.Hours)

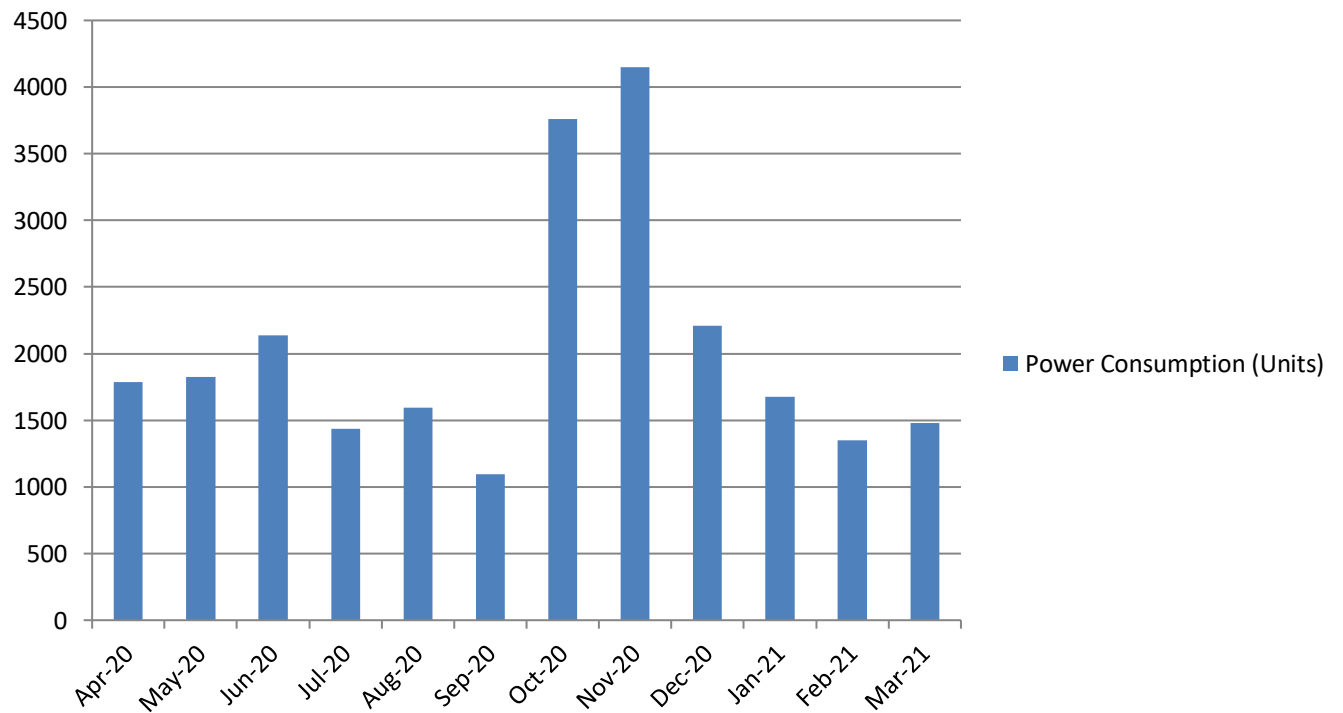


Month wise Energy Consumption:

Month	Power Consumption (Units)
Mar-21	1478
Feb-21	1348
Jan-21	1675
Dec-20	2207
Nov-20	4150
Oct-20	3758
Sep-20	1094
Aug-20	1594
Jul-20	1437
Jun-20	2135
May-20	1823
Apr-20	1787
Total	24486

Average Energy Consumption in one month = 2040 units

Month wise Power Consumption (Units)



Recommendations

- 1) Replace all conventional tube lights with LED tube lights, to save more power.
- 2) In Physics laboratory, 3 -phase connection for furnace and water distillation plant is taken from microbiology lab. Separate 3-phase connection should be provided to avoid power load
- 3) In old building, there is need to replace the electric boards and electric fitting.
- 4) In some classrooms there is requirement of fans and tube lights.
- 5) Install solar plant to reduce electric bill.
- 6) Switch off Light, fans, P.Cs. and other electrical appliances whenever they are not in use.

Energy saving calculation:

- 1) If the conventional tube lights are replaced with LED tube light, a large amount of energy can be save.

Total number of conventional tube lights in college campus = 143

The average power of conventional tube light = 40 W

The average power of LED tube light = 20 W

Difference in power saved per tube light = $(40 - 20) = 20$ W

Total power saving = $143 \times 20 = 2860$ W

Let average use of each tube light per day = 5 Hours

Energy saved per day = $2860 \times 5 = 14300$ Watt.Hours = 14.3 KW.Hours = 14.3 units

Energy saved in one year = $14.3 \times 365 = 5219.5$ units

The reduction in electric bill in one year = $5219.5 \times 4.86 = 25366$ Rs

Average cost of single LED tube light = 400 Rs

Total cost of replacing all conventional tube lights = 57200 Rs

Pay back period required = $57200/25366 = 2.25$ Years

- 2) If the old ceiling fans are replaced with 5 star energy saving fans:

Total number of ceiling fans in college campus = 119

The average power of existing ceiling fan = 80 W

The average power of 5 star energy saving ceiling fan = 50 W

Difference in power saved per ceiling fan = $(80 - 50) = 30$ W

Total power saving = $119 \times 30 = 3570$ W

Let average use of each ceiling fan per day = 5 Hours

Energy saved per day = $3570 \times 5 = 17850$ Watt.Hours = 17.85 KW.Hours = 17.85 units

Energy saved in one year = $17.85 \times 365 = 6515.25$ units

The reduction in electric bill in one year = $6515.25 \times 4.86 = 31664$ Rs

Average cost of single 5 star energy saving fan = 1600 Rs

Total cost of replacing all ceiling fans = 1,90,400 Rs

Pay back period required = $1,90,400/31664 = 6$ Years

Estimate for installation of solar plant in college campus:

Department wise required power load:

S.N.	Department	Power Load (Watt)
1	Physics	2880
2	Computer Science	3130
3	Chemistry	2094
4	Electronics	1464
5	Microbiology	3512
6	Zoology	2020
7	Mathematics	1354
8	Botany	1930
9	Commerce	3306
10	English	2080
11	Social Sciences and Humanities	104
12	Library	6076
13	Physical Education, NSS	976
14	Health Center, NCC	840
15	Administration office and Principal's Cabin	4740
16	IQAC	1220
17	Seminar Hall	1510
18	Staff room	890
19	Auditorium	480
20	Canteen and Book shop	1480
21	Classrooms	1520
	Total	43606

Total required power load = 44 kW

Note: While calculating power load, the technical instruments with high power rating (Furnace, incubator, oven etc) in Physics, Chemistry, Botany, Zoology and Microbiology departments are not taken into consideration.

Approximate expenditure required to install solar plant of 1 kW = Rs. 60,000/-

Approximate space required to install solar plant of 1 kW = 1 m²

The approximate units produced by solar plant of 1 kW per day= 4 units

The approximate units produced by solar plant of 1 kW in one year= 1460 units

Approximate Saving in electric bill in one year = Rs. 10,000/-

Payback period = 6 years

----- THE END -----

7.1.2 ENVIRONMENT PROTECTION AND ENERGY CONSERVATION



Environment Awareness Activities

Tree Plantation 2020 -21

On 1.07.2020, 200 trees were planted, and tree conservation was done at various places in the college premises and other places around Dhamangaon rly. On this special occasion of tree plantation, the students planted trees of different species like Wad, Pimpal, Karanj, Neem, Saptaparni, Eucalyptus, Kanchan, Sitaphal etc. Eco friendly tree guards has been made for the protection of newly planted trees. Despite of tough times of corona pandemic most of the student volunteers participated in the campaign from their home itself and sent photographs of planted trees on college Whats app group. Some interested volunteers and college staff members willingly participated in the college. Principal of the college, Dr. Y. B Gandole participated with full dedication and planted trees in the college Botanical Garden and college premises.



Wildlife conservation:

Wildlife week 2021 was celebrated by the department of Zoology through a function on 4 October 2008 by an activity “wildlife at your doorstep” in which the students visited the schools at their hometown and they aware the school going students about wildlife and forests. The focus of this year’s programme was on changing attitudes of children towards wildlife, specifically weaning them away from: · Using catapults and wanton killing of birds; · Disturbing nests and removing eggs and fledglings from nests; · Killing of reptiles, particularly snakes · Keeping wild birds and animals as pets. The schools that participated in the programme were Z. P. Primary School Borwaghal and Dr. Babasaheb Ambedkar School, Dhamangaon Railway. This attempt was to alter the attitudes of children in favour of wildlife and change specific behaviour that harms wildlife. All the activities during the wildlife week function were designed with this in view and were a culmination of conservation awareness activities that have been undertaken with the selected schools since 2019.

On 5th October 2021, the inaugural function of wildlife week and Zoological society was organized. The programme was presided over by Respected principal Dr. Y. B. Gandole, Dr. Anand Naranje, IQAC Co-ordinator, Dr. S. O. Qureshi, Professor and Head, Department of Zoology and Shri. Yadav Tarte Patil, Member, State Board for Wildlife, Government of Maharashtra. The Zoological Society was inaugurated at the hands of Chief Guest Shri. Yadav Tarte Patil and the office bearers were declared as President: Ku. Gayatri Bante, Vice President: Ku. Isha Unone, Treasurer: Ku. Sakshi Nikam. On the occasion the chief guest guided the students on wildlife and its importance.

On 6th October a task of tree plantation and selfie during installation of artificial bird nest or artificial bird feeder was given in which students participated in huge number. On the same day an online seminar competition on conservation of wildlife was organized in which first prize was grabbed by miss Mrunmayee Kulkarni from Brijlal Biyani Science College, Amravati.

On the 7th October valedictory function was organized in the presence of Professor Dr. Praveen Joshi, Department of Zoology, Amolakchand Mahavidyalaya, Yavatmal. He delivered a guest lecture and guided the students on how birds are ecological indicators. It was followed by prize and certificate distribution.



SELFIE WHILE INSTALLING BIRD NEST ON 06.10.2022



WILDLIFE WEEK: 2021 CELEBRATION AT DR. BABASAHEB AMBEDKAR SCHOOL ON
04.10.2021



WILDLIFE WEEK : 2021 CELEBRATION AT Z. P. PRIMARY SCHOOL, BORWAGHAL ON

04.10.2021

DHAMANGAON EDUCATION SOCIETY'S
ADARSHA SCIENCE, J. B. ARTS AND BIRLA COMMERCE MAHAVIDYALAYA, DHAMANGAON RAILWAY, DIST. AMRAVATI

DEPARTMENT OF ZOOLOGY
IN COLLABORATION WITH SCIENCE ASSOCIATION, IQAC, AMV DHAMANGAON RAILWAY

ORGANIZED
NATIONAL LEVEL CELEBRATION OF WILDLIFE WEEK: 2021

CERTIFICATE OF PARTICIPATION

THIS CERTIFICATE IS PRESENTED TO FOR PARTICIPATING IN THE NATIONAL LEVEL PROGRAM ON CELEBRATION OF **WILDLIFE WEEK: 2021** CONDUCTED FROM OCTOBER 4TH 2021 TO OCTOBER 7TH 2021. IN CONSONANCE WITH THIS YEAR'S THEME OF **"FORESTS & LIVELIHOODS: SUSTAINING PEOPLE AND PLANET"**

 Teacher In charge Mr. J. G. Suryawanshi Asst. Professor	 Convener Dr. S. O. Qureshee Professor & Head	 Coordinator Dr. S. V. Manohare Science Association	 Principal Dr. Y. B. Gandole
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Rain water Harvesting:

The college has setup a rain water harvesting unit to improve ground water level in campus as water scarcity is a major problem during summer in Dhamangaon railway. Well water recharge system is also installed in college to prevent well from being deficient.



Seed Ball Activity

Seed ball activity has been conducted in concern with environment protection and conservation. This seed ball activity has been conducted during 30.05.2022 to 05.06.2022. Most the student form NSS and other department has participated along with some teachers and senior NSS volunteers. During this activity, seed of endemic plants with are wild as well as has some medicinal properties has been intentionally selected and their seeds has been collected during summer season. During preparation of the seed balls, cow dung, vermicompost and compost soil has been prepared in the form of balls and some 4 to 5 seeds has been inserted in it. During onset of the rainy season, all these seed balls as been spread in the barren field by the students which eventually get germinated and converted into the wild plants. About 38 students and 5 teachers has participated in this event and this event has been organized by the NSS department since 4 consecutive years. There about approximately 14 wild plant seeds have been selected for seed ball preparation.

Seed Ball Campaign

The Green Army and NSS team, formed last year, produced and distributed environmentally friendly seed balls at home during the summer months of May and June. 2000 seed balls of different types of tree seeds were prepared and distributed in schools and various government departments. With the message of saving the environment, it was worthwhile to establish the Green Army of the college. The government also mentioned about the activities of this college on TWITTER. Not only the environment but also the students were seen working as bird / animal friends.

← Tweet

 **Maharashtra Goa NSS**
@MaharashtraNSS

NSS unit of Adarsh College prepared 2000 seed balls and planted them near the house and also planted 100 trees in the area .@PMOIndia @CMOMaharashtra @RijijuOffice @YASMinistry @_NSSIndia



2:58 · 09 Jul 20 · Twitter for Android



संत गाडगे बाबा अमरावती विद्यापीठ संलग्नित
धामणगाव एज्युकेशन सोसायटी हिंदी अल्पसंख्यांक शैक्षणिक संस्था द्वारा संचालित
आदर्श विज्ञान ज. भा. कला व बिरला वाणिज्य महाविद्यालय,
धामणगाव रेल्वे, जिल्हा अमरावती - ४४४७०९

राष्ट्रीय सेवा योजना
द्वारे आयोजित

75
आज़ादी का
अमृत महोत्सव

पर्यावरण जनजागृती व स्वच्छता सप्ताह
दिनांक 30.0५.2022 ते 0५.0६.2022



आपला हातातही प्रकृती रक्षणी

अभियान समाचार
संपादक : नितीश रोडे

सोमवार दि. १३ जून २०२२

आदर्श महाविद्यालय येथे माझी वसुंधरा आणि आजादी का अमृत महोत्सव अंतर्गत "पर्यावरण जन जागृती व स्वच्छता सप्ताह" संपन्न

धामणगाव रेल्वे दि. १३ | प्रज्ञीत पण्डे

राष्ट्रीय सेवा योजना (मंत्रालय कक्षा), उच्च व तंत्र शिक्षण विभाग, महाराष्ट्र शासन यांच्याकडून प्राप्त पत्रानुसार राष्ट्रीय सेवा योजना संच, आदर्श विज्ञान, ज. भा. कला व बिरला वाणिज्य महाविद्यालय धामणगाव रेल्वे येथे माझी वसुंधरा व आजादी का अमृत महोत्सव अंतर्गत "पर्यावरण जन जागृती व स्वच्छता अभियान" दिनांक ५ जून ते १३ जून इत्यादी हे अभियान दि. ३० मे ते ५ जून या कालावधी मध्ये राबवण्याचे निर्देश महाराष्ट्र शासनाकडून प्राप्त झाले होते. ज्या अनुषंगाने राष्ट्रीय योजना आदर्श महाविद्यालय, धामणगाव रेल्वे येथील प्रभू या सप्ताहामध्ये विविध कार्यक्रम राबविले. या सप्ताहाचा उद्घाटन सोहळा दि. ३० मे रोजी

केण्यात आला व निरोप समारंभ दि. ५ जून रोजी संपन्न झाला. या विशेष सप्ताह दरम्यान राष्ट्रीय सेवा योजना च्या प्रत्येक दिवशी विशेष कार्यक्रम राबविले. या मध्ये १. उद्घाटन सोहळा, २. शीन कलब वी स्थापना, ३. सिट-वॉल उपक्रम, ४. परिसर स्वच्छता व सूत्र लगेचच कार्यक्रम, ५. प्लास्टिक निर्मूलन व ईको थ्रिफ्ट उपक्रम, ६. पर्यावरण जन जागृती असे अनेक विविध समाज उपयोगी कार्यक्रम राबविले. हे उपक्रम राबवण्याचा

मुख्य उद्देश असा होतः कि पर्यावरण संवर्धन व स्वच्छतेचे महत्त्व समाजाच्या तळा गाळत विद्यार्थ्यां मार्फत पोहोचले जाई. निरोप समारंभाने दिवशी महाविद्यालयाचे प्रचार्य डॉ. वाय. वी. गोळे यांनी पर्यावरण संवर्धन व शक्ति विकास या वर विद्यार्थ्यांना मार्गदर्शन केले व उपलब्धद्वारे समाजत हा पर्यावरण संवर्धनाचा संदेश पोहचवा असे आवाहन केले. या संपूर्ण सप्ताहाने वेगवेगळे उपक्रम राबवण्यासाठी वे

संपूर्ण नियोजन प्रचार्य डॉ. वाय. वी. गोळे यांच्या मार्गदर्शनाखाली रा येथे कार्यक्रम अधिकारी प्रा. श्रीकांत पाटील, रा से येथे वाय. कार्यालया अधिकारी डॉ. प्रवीण के. महिषा कार्यक्रमा अधिकारी वी. पुनम गडुकर यांनी केले व राष्ट्रीय सेवा योजनेचे शाक राई, तेजस गवारे, प्रतिक नगरीकर, साही गोळे, सुनील वंजरी, वैष्णवी गावंडे, संस्वती मंडले, कुष्णा पांडे, सुकुती सौंदर्य, वैष्णवी सुंदकर, अनुयायि शिंदे, प्राची सुनील, अनुयायि निशाण, सोमल गुला, अंजु दानके, साहली गुला, वादवी गावंडे या स्वयंसेवक, स्वयंसेविकांनी कार्यक्रमाच्या यशस्वी करिता विशेष परिश्रम घेतले.

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Green Army

NSS volunteers have registered their names for Green Army to support local environment and heritage conservation. Through this army various environmental activities are carried out in campus, Dhamangaon and at dattak gram during camp.





Eco brick Campaign

Eco Brick Campaign

Eco Brick Campaign activity were started on 20.09.2020. The landscape was created in the form of a mini garden from about 500 eco-bricks collected. Over the last 6 months, enthusiastic students and teachers of NSS started making bottles together with the pure intention of saving about 200 kg of plastic from burning and preventing pollution in the environment due to plastic. An experiment was carried out to beautify the college. It is started with Commerce Department, working as time would allow. The volunteers expressed their intention to carry all the trees from the next 500 bottles of Eco Brick. Dr. Anand Naranje, Dr. Rishiraj Kuralkar, Dr. Madhuri Kopulwar, Dr. Vishnu Sadaphale, Dr. Poonam Gahukar, Dr. Shilpa Vidhale along with many students provided special assistance during thie whole event.

Photographs of the Event



Eradication of Single Use Plastic

Report

The National Service Scheme team at Adarsh Mahavidyalaya, run by Dhamangaon Education Society, volunteered for the Plastic Eradication Campaign and volunteered through a number of small and large initiatives. As per the guidelines, it was thought that the place where the students reside would be cleaned first, proper disposal of plastic waste and proper use of the accumulated plastic would be done. As a result, or response, plastic eradication campaigns were successfully carried out in about 8 villages. In which 55 volunteers contributed. The photos were taken by google location while carrying out the activities in different areas for. Eco bricks were made by filling the collected plastic in bottles. And it is being used to beautify the college campus and work is underway on it.

आदर्श महाविद्यालय, धामणगाव रेल्वे

राष्ट्रीय सेवा योजना

प्लास्टिक निर्मूलन अभियान 2021-22

जे विद्यार्थी या अभियानामध्ये सहभागी होणार आहेत त्यांनी आपल्या आजूबाजूचा परिसर ओळखून जिथे कुठे प्लास्टिक घनकचरा असेल तिथे प्रत्याक्षयात एकटे किंवा समूहामध्ये जाऊन प्लास्टिक कचरा गोळा करावा असे आवाहन करण्यात येत आहे.

प्लास्टिक कचरा गोळा करतांना आपल्या मोबायल मध्ये GPS CAMERA APP DOWNLOAD करून घ्यावे आणि कचरा गोळा करतांना फोटो काढून कार्यक्रम अधिकारी यांना सेंड करावे. प्लास्टिक गोळा करतांना पुढील गोष्टीचा वापर करून फोटो काढावेत.

BEFORE → DURING → AFTER

**चला पर्यावरण संरक्षणासाठी काहीतरी करूया
प्लास्टिक निर्मूलन करूया**

माझ्यासाठी नव्हे तर तुमच्यासाठी

आदर्श महाविद्यालय धामणगाव रेल्वे

राष्ट्रीय सेवा योजना

प्लास्टिक निर्मूलन अभियान 2021-22



सरकारी आदेशानुसार आपल्या महाविद्यालयातील राष्ट्रीय सेवा योजने अंतर्गत प्लास्टिक निर्मूलन अभियान राबविण्यात येत आहे. राष्ट्रीय सेवा योजनेचे स्वयंसेवक कु. अपिता शर्मा, कु. सिमरन तुळसकर यांनी अभियानाला सुरुवात केली आहे त्यांनी त्यांच्या परिसरातील देवटाई मधील संपूर्ण प्लास्टिक गोळा केले आहे.



Mazi Vasundhara

Like every year at Adarsh Mahavidyalaya run by local Dhamangaon Education Society, this year also on Wednesday 1st September, a tree planting program was organized by Adarsh Mahavidyalaya and National Service Scheme and NCC in Dhamangaon railway town of Amravati district in the premises of the college. The concept of planting 100 trees was implemented by NSS Unit and NCC unit under the initiative 'Majhi Vasundhara' of the Government of Maharashtra.

On this occasion, the program officer of the National Service Scheme Program officer, Mr. Shrikant Patil, Assistant Program Officer Praveen K., officer of NCC, Lt. Mr. A. B. Bund Sir, NSS Former Program Officer, Dr. Narendra Nagpure, Head of Sports and Sports Department, Dr. M. Y. Kopulwar, Dr. Anand Naranje, IQAC Head, Shri Sandeep Pendam, Head of Botany Department were present during the event.



Single use Plastic and Cycle Rally

A cycle rally was organized on 4th January 2020 to raise awareness about environment, plastic release and health to the rural people of Dhamangaon railway area. While the rally was passing through 8 villages, the men and women of the village were sensitized and a message was given to them not to use plastic bags by distributing paper and cloth bags made from newspapers along with various billboards. Visiting Old Dhamangaon, Shahapur, Dabhada, Kavali, Vasad, Vathoda, Jalgaon villages, 50 Raseyo active volunteers participated up to 25 km on their own bicycles. In the presence of Prof. Nilesh Mohokar in Kavali village, everyone took an oath to protect women. In this, the program officer and co-program officer inspired others by riding their own bicycles.



पर्यावरण व प्रदुषण जनजागृति के लिए साइकिल रैली

आदर्श महाविद्यालय का आयोजन

धामणगांव रेलवे, 7 जनवरी. वर्तमान परिस्थिति में पर्यावरण रक्षण, प्रदूषण, स्वास्थ्य, प्लास्टिक मुक्ति, एड्स, जनजागृति, महिला रक्षण जैसी समस्याओं को लेकर जनजागृति करने के उद्देश्य से राष्ट्रीय सेवा योजना द्वारा साइकिल रैली का आयोजन किया गया. आदर्श महाविद्यालय से शुरु हुई यह रैली को धामणगांव एजुकेशन सोसायटी के उपाध्यक्ष प्रदीपकुमार लुणावत तथा महाविद्यालय के प्राचार्य डा. गांडोले, प्रा. डहाके, प्रा. धामसे, डॉ. श्रुंगरे आदि उपस्थित थे. बढ़ते प्रदूषण को ध्यान में रखकर साइकिल चलाने का प्रयास सभी ने अपनाना चाहिए. केवल विचार कर नहीं, बल्कि उसे स्फूर्ति में उतारने की बात डा. नरेंद्र नागपुरे तथा महिला कार्यक्रम अधिकारी डा. माधुरी कोपलवार इन शिक्षकों ने प्रत्यक्ष साइकिल चलाकर युवकों के समक्ष उदाहरण प्रस्तुत किए. 18 लड़के तथा 14 लड़कियों ने पुराना धामणगांव, शहापुर आदि गांवों का भ्रमण किया. एक दिन में 8 गांव में 8 घंटे में जनजागृति करने के उद्देश्य से (शेष पृष्ठ 2 पर)