Green & Environment Audit Report (2020-21)

CONDUCTED BY :
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Shreyas Quality Management System

(ISO 9001:2015 QMS, ISO 14001:2015EMS & 45001 Certified Organization)

GREEN CERTIFICATE

This Certificate has been awarded to

Shri Ramdeobaba College Of Engineering And Management

Ramdeo Tekdi, Katol Road, Gittikhadan,

Nagpur- 4410013. Maharashtra

In Recognition of the Organization Efforts for Sustainable Efforts

SQMS/CERT/GA/20-21/II/01
SQMS Certificate No.

30.03.19
Date of Issue

Expiry Date:

11.03.22

Date of Re-Issue

12.03.21

Dr. R. R. Lakhe (Director)
Shreyas Quality Management System

Note: Certificate validity is based on organization compliance on green audit recommendation and continual maintenance of the system and conduction of regular green audit

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AKNOWLEDMENT

Green Audit Assessment Team thanks **Shri Ramdeobaba College of Engineering and Management (RCOEM), Nagpur** for assigning this important work of Green & Environmental Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to Principal – Dr. Rajesh Pande & Team members for giving us necessary inputs to carry out this very vital exercise of Green Audit.

We are also thankful to Department Heads and other staff members who were actively involved while collecting the data and conducting field measurements.

Dr. R. R. Lakhe
Director

Shreyas Quality Management System, Nagpur.

DISCLAIMER

Green and Environment Audit Team has prepared this report for **Shri Ramdeobaba College of Engineering and Management (RCOEM), Nagpur** based on input data submitted by the representatives of College complemented with the best judgment capacity of the expert team. The audit was conducted on the sample basis by visiting the college and interacting with the various stakeholders. Audit was conducted by interviewing the concerned persons, observing on-site implementation and verifying the documents and records.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the recommendations are arrived following best judgments and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

Prepared by:
Mr. M. M.Naveed, Sr.Consultant
Shreyas Quality Management System, Nagpur

Technical Review by:

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Mr. Syed Nasir, Sr.Consultant

Executive Summary:

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green and Environmentally sustainable practices on the Campus of the institute which will lead for sustainable development.

Shri Ramdeobaba College of Engineering and Management is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends of pollution. Being a premier institution of higher learning, the college has initiated 'The Green Campus' program two years back and has actively promoted the various projects for the environment protection and sustainability.

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Environment Policy adopted by the institution and also following the practices of ISO 14001-2015 EMS. It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit are to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the Departments are in compliance with the Green and Environment Policy. It can make a tremendous impact on student health, reducing college operational costs and improvement in the environment. The criteria, methods and recommendations used in the audit were based on the identified risks.

Vision

Shri Ramdeobaba College of Engineering and Management envisage the institute par excellence, providing world class technical and management education.

Mission

To impart quality education in the field of Engineering and Management and to foster mutually beneficial relationship with industries to create an intellectually stimulating environment for learning, research and for promoting professional and ethical values.

Quality Policy

Shri Ramdeobaba College of Engineering and Management is committed to achieve exemplary standards in Engineering and Management Education.

We aim at continuous improvement of all our processes and will strive to provide an environment conducive to the pursuit of knowledge and overall personality development.

We encourage all to adhere to the highest ethical standards and professional integrity and aim to enhance the satisfaction level of all stakeholders.

INTRODUCTION:

Green and Environment Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. Green and Environment audit can be a useful tool for a college to determine how and where they are using the most energy or water or 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. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

A Nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with environment. Educational institutions now a days are becoming more sensitive to environmental factors and more concepts are being introduced to make them eco-friendly. To preserve the environment within the campus, various viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc.. The activities pursued by colleges can also create a variety of adverse environmental impacts. Environmental auditing is a process whereby an organization's environmental performance is tested against its environmental policies and objectives.

Green and Environment audit is defined as an official examination of the effects a college has on the environment. As a part of such practice, internal environmental audit (Green Audit) is conducted to evaluate the actual scenario at the campus. Green and Environment audit can be a useful tool for a college to determine how and where they are using the most energy or water or 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 and Environment auditing and the implementation of mitigation measures is a win-win situation for all the college, the learners and the planet. It can also create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. Green and Environment auditing promote financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. ISO 14001-2015 Environmental Management Systems (EMS) is very popular in the industrial sector, but the general belief is that EMS is something pertaining to industries only. Other parts of the world have started adopting compatible environmental management systems either voluntarily or for promoting standards by external certification.

Objectives of the Audit:

The main objective of the Green and Environment audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green and Environment Audit are:

- To verify the activities undertaken by the college o secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource used on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
- To bring out a status report on environmental compliance

In order to perform Green and Environment audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarize the present status of environment management in the campus:

- **Water management**
  - Raw Water
  - Drinking Water
  - Laboratory Waste Water
  - Sewage Water
  - Rain Strom Drain Water
  - Washroom water
  - ETP
  - Waste water
- **Energy Conservation**
  - Petrol
  - Diesel
  - LPG
  - Electricity
  - Batteries
  - Solar Energy
- **Waste management**
  - Hazardous Waste
  - Non- Biodegradable Solid Waste
  - Biodegradable Municipal Solid Waste
  - Bio- Medical Waste
  - Kitchen Waste
  - E-waste management
- **Green area management**

Review of the Documentation:

Green and Environment Policy & ISO14001 Environment Management System requirements.

Interviews:

Interviews were conducted with the Principal, and also faculties and students.

Physical Inspection:

The audit team visited the college to inspect the campus and review Green and Environmental actions.

Auditors for Green and Environment Audit:

Sr.No.	Name of Auditor	Designation
1	Dr. R. R. Lakhe	Director, SQMS, QCI, NBQP registered Environment Consultant
2	Dr. Ritesh K Singh	ISO 14001 EMS auditor Sr. Chemist, MSPGCL, Environment System Auditor
3	Syed Nasir	ISO 14001 EMS auditor, Sr. Consultant, SQMS, Certified Energy Auditor from Bureau of Energy Efficiency (BEE)
4	Mr. M.M.Naveed	ISO 14001 EMS auditor , ISO 14001 EMS auditor Sr. Consultant, SQMS Nagpur, Environment System Auditor

About College:

Shri Ramdeobaba College of Engineering and Management (RCOEM) was established in 1984 by Shri Ramdeobaba Sarvajanik Samiti (SRSS), a trust which has been involved in community service for over four decades. More than 30 years of existence has helped RCOEM grow deep roots and establish a strong foundation in technical education. Journey of a student in this institute has always involved comprehensive knowledge building from practical skills, theoretical knowledge to personality development, which has given them a head-start in their career.

We encourage all to adhere to the highest ethical standards and professional integrity and aim to enhance the satisfaction level of all stakeholders. Autonomy RCOEM was granted progressive academic autonomy from the session 2011-12. Various statutory bodies such as Board of Management, Academic Council, Board of Studies, and Finance Committee have been constituted and an industry need-based syllabus has been introduced.

1.2. No of Branches(18)

Departments • First Year Engineering

- **Applied Sciences & Humanities**
  - Chemistry o Humanities
  - Mathematics o Physics
  - Physical Education
- **Computer Application**
- **Engineering**
  - Civil
  - Computer Science

- Electrical
- Electronics
- Electronics and Communication
- Electronics Design Technology
- Industrial o Information Technology
- Mechanical

• Management Technology

1.3 No of Buildings & its details

1. Admin Block
2. Mgmt Tech Building
3. Civil Engg
4. IT Block
5. Electrical Block
6. Workshop
7. EN Block
8. First Yr. Block
9. MCA Building
10. Boys Hostel
11. Boys Mess & Gym Area
12. Girls Hostel

Name of the Institute: Shri Ramdeobaba College of Engineering and Management.

- No. of Branches:UG-09, PG: MTech-07, MBA, MCA, MBA (Integrated)
- No. of Students: Intake UG-810, PG-441, Total: 4685
- No. of Faculty Members:279
- No. of Non-Teaching Members:159
- No. of Buildings:12+ 1 Temple+1SubStation
- Total campus area: 44596.35 m2
- College building Spread Area: 34011.08 m2
- Girls common room: 12

	No. of Student	No. of Teachers	Non-teaching staff
Gents	2872	167	124
Ladies	1813	112	35

Garbage collection bins:198

- **Lab:76**
- **Class room:66**
- **Boys class room:3**
- **First aid/Sick room:1**

ENVIRONMENTAL POLICY

Management faculty and staff of Shri Ramdeobaba College of Engineering and Management is committed for carrying out its activity for sustainable development. This we will achieve through the following-

- To Use Solar Energy on College Campus by installing Solar Lamps and Solar water Heaters in Girls and Boys hostels.
- To sensitize the students and staff regarding the use of water properly
- To bring in use the 'Rain Water Harvesting' on the campus.
- To maximize the use of ICT and minimize the use of paper. It will help to go towards 'Paperless Office'.
- To use the solid waste through vermin-compost on the campus and use it as a fertilizer.
- To reduce the 'sound pollution in the campus,
- To protect and nurture the Flora and Fauna on the campus
- To maintain green campus

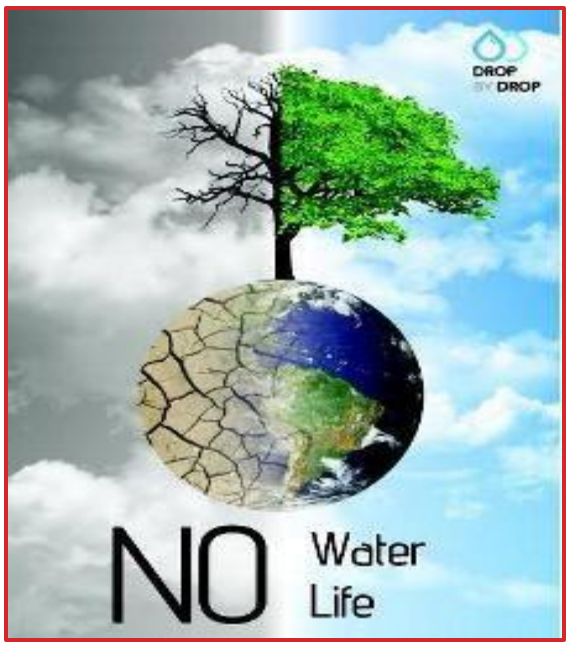
Good Points:

1. College has formed the team of faculty and student as REEF which works to maintain biodiversity on the campus and also participates in preventing pollution in society through various drives.
2. College has installed solar panels and increasing upto its maximum capacity.
3. Environmental subject is included in teaching plan.
4. College has a system of e- waste disposal through authorized agency.
5. Tree plantation at college premises is taking place and encourages students to plant the trees.
6. College has Vermicomposting facility installed.
7. College has installed sewage treatment plant for the purification of entire effluent water collected from the college.
8. College has developed and implemented Environmental Policy.
9. Arranged training program for the staff of the college on Green Environment.

As a part of the Green Initiatives the practices followed are:

- 460 kW Roof top PV Solar power plant
- 200 KLD Sewage Treatment Plant
- Rain Water Harvesting to improve the Ground water Table
- Green innovation –Garden waste degradation by Vermicomposting
- Overall lighting through LED Bulbs in campus
- Student participation in environment activities announced by AICTE
- Eco –Club , REEF
- Green Audit-as per ISO 14001 guidelines
- Total No. of plant in Campus= 984

A. Water Management:



This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

Water conservation is a key activity as water availability effects on the development of the campus as well as on all area of development such as farming, industries, etc. Keeping this in view water conservation activity is carried out by the college.

The college uses approximate 1500 Taps. It has 4 wells with 1 dug well and 3 bore wells. Main source of water is Municipal water. The present depth of water is 30 feet in well. The college stores the water in overhead tank and sump. There are two sumps storing 2 Lakh & 1.5 Lakh liters of water and overhead tank with 1 L capacity. Every day about 1 Lakh liter of NMC water is pumped. Wastage of water is prevented by closing the valves manually. No leakage of water is detected during the audit. The waste water mainly comes from labs, washrooms & kitchen & waste water is released to soap pit. Construction of STP is in progress. At present waste water is not used for any other purposes. At present lab water is released in common drainage of qty. 5000 Ltr/week. Treatment of lab water is carried out at present. In order to reduce the amount of water used in college, push taps or timers in urinal is proposed. The details of the pump used for pumping the water in overhead tanks are as follows-

Sr.No/	No. of Pumps	Power	Location
1	4	5HP	Main water tank
2	3	3	MBA, IT &Electrical Dept
3	1	1	Admin. Building

- Dug well gets dry and has pump of 3HP and is operated 3 days for 2 Hrs. while bore well has 2 pumps of 3 HP and one pump of 1Hp and operated daily for 3 Hrs.
- Rainwater harvesting is done by the college.
- There are no technical data at present to analyse the amount of water lost.
- There are no water fountains.
- Drip irrigation is used to water the plants.
- Garden is watered twice in a day for 2 Hrs each.
- College can prepare water management plan with new water saving techniques.
- Slogan for water saving are displayed at various places in the college and in hostels buildings.
- Water management is part of the civil engineering curriculum.

Sources of Water:

-Municipal corporation Water

-Well water

-Bore water

-No. of flow meters attached and their locations.: One near OHT

Location/ Area	Avg. total consumption of water per day
1.College	68330
2. Gardening	41000
3. Labs	27330
4. Hostel	95665
5. Utilities/uses	13665
6. Canteen	27330

Good Points:

In college campus water conservation is done at two levels:

1. Rain Water Harvesting
2. Reuse of Waste Water

RAIN WATER HARVESTING:

Rain water harvesting (RWH) is a technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifers (before it is lost as surface runoff). One method of rainwater harvesting is rooftop harvesting. With rooftop harvesting, most any surface — tiles, metal sheets, plastics, but not grass or palm leaf — can be used to intercept the flow of rainwater and provide a household with high-quality drinking water and year-round storage. Other uses include water for gardens, livestock, and irrigation, etc. The tanks also served as natural aquifers and helped recharge groundwater.

There were two recharge pits for rain water harvesting. Due to geographical reason as there were rocks beneath the college premises it is difficult to build the more water recharge pits in the college.

College has installed one ETP for treating the college effluent and drainage the good water in drain.

The sources waste water are categorized in two types:

I. Laboratory Waste Water which can be said as Effluent and
II. Domestic Waste Water i.e. Sewage Water.

The effluent produced in this college is about 5000 liters per week per laboratory and there are two such laboratories producing effluent. One, first year Chemistry Laboratory and second, the Environment Laboratory in Civil Engineering department. The effluent produced in chemistry department is released after treating and neutralization into the common drainage.

The Sewage water mainly comes from washrooms of college, hostel, kitchen and canteen. The sewage is released in ETP for treating the effluent and drainage the good water in drain.

Recommendations:

The team of Auditors appreciates the College administration for the good practices in conserving water such as regular plumbing services, regulating the water flow from top and some of the flushes are switched to water efficient flushes. There is willingness to explore the option of Waste Water Treatment thus the (plant based) recycled water can be utilized for the toilet flushing and gardening if it is implemented successfully. It is not possible to estimate the exact quantity of water used by different departments. However the highest consumption of water is most likely happening in toilets,

hostels, canteen, and in chemical lab in view of the escalation of water scarcity in the region team recommend basic steps be carried out to optimize the water utilization at the college level, which will also contribute to reducing the related expense:

I. Putting up notices in all washrooms and near all water coolers about the need for saving water, and simple tips like ensuring all the taps are properly closed, leakages are immediately brought to the notice of the management, respective floor cleaning staff could be given the responsibility to keep a check on every floor if any taps are open or leaking.

II. To eliminate the spillage and over usage of water in washbasins, urinals and toiler push taps are highly recommended.

III. Training to the cleaners in economical use of water for cleaning purposes and a system in place for immediate response when issues of water leakage are observed so that water losses are prevented.

IV. Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged. In campus small scale/medium scale/ large scale reuse and recycle of water system is necessary.

V. Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration (Drinking Water) process and ensure that the equipment's used for such usage are regularly serviced and the wastage of water is not below the industry average for such equipment's used in similar capacity.

VI. Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.

VII. Electrical fittings and plumbing kept in proper condition to prevent electricity leakage and water dripping. All water taps to be checked for its leakage particularly in toilet (Hostels).

VIII. Identification of areas to be carried out such as compost making area, water harvesting tank, bore well used for water harvesting purpose, bore well used for consumable purpose, parking area of staff, students, hazard area etc.

IX. Water meter to be installed in both borewel as well as well which is used and daily monitoring and record of water used to be maintained.

X. Cleaning schedule of water purifier to be made and followed.

XI. Water consumption of the college to be monitored and graphs/table to be prepared.

XII. Water to be tested from various source including the potable water purifiers and in canteen.

XIII. Maintenance of water purifier to be done including replacement of filters.

XIV. Step by step include the water meter or flow meter to each and every building and monitor the water consumption record.

XV. Special Internal Water Audit to be conducted quarterly and should be headed by HOD Civil Department

XVI. **Water Bill for last 12 Months**

March 19	Apr 19	May 18	June 19	July 19	Aug 19	Sept 19	Oct 19	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20
285892	289916	243036	244707	225665	240945	183056	295829	148221	226303	233499	200394	240094

Energy Use and Conservation:

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. The college primarily uses energy in the form of electricity provided by MSEDCL. A proper analysis of energy consumption, we need to understand the electricity consumption over at least one academic year, and ideally three previous years. Major use of the energy is at office and laboratories of different departments for lighting, practical and laboratory work. The main electric appliances in the college are mechanical workshop, fans, computers and LCD projectors, and computers , lab equipments, lifts, mechanical workshops and accessories Major energy consumption equipments are the high wattage electrical appliances such as Air conditioners, water coolers, geyser installed at boys and girls hostels, deep freezers, etc.

Good Practices:

In all sections of campus lecture rooms, office rooms, laboratories etc are spacious voluminous and airy, having proper natural light and ventilation. Hence actual requirement energy consumption in lightening is minimal. The air conditioners in the management chamber or in Principal Chamber are rarely used and avoiding unnecessary use of the same is a part of the green practice in the College. Besides this, **solar system is also installed in the campus as an alternate renewable source of**

energy,. Equipments like Computers are used with power saving mode. Also, campus administration runs switch –off drill on regular basis.

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

Aim and objective:

- To save conventionally produce electric energy
- Use of non- conventional source of energy
- Use carbon neutral electricity
- Minimization of electric expenses

Observations

Following Energy Sources are used in the college:

- **Solar**
- **Electrical**
- **Diesel**
- **LPG**
- **Petrol**

Some of the "Green Practices" on the Campus includes; the display of the instruction boards/notices displayed on each classrooms/ lab for switching of the fans and lights when not required. Switching to star rating electric appliances in phase wise manner, new fans are installed in phases, step by step process of replacing CFL with LED light,. The College building has 4 lifts; the lift is operated for disabled person and for old person only. The instructions are displayed.

- Electrical energy consumption per day for institute--2676 Units/day as per Avg. of Record 2017-18
- % of LED lamps of total lightning of the campus-65.21%
- Institute have policy to procure BEE approved, 5 star Rating energy devices/instruments/utilities.
- Total no. of ACs Spilt Ac:140, Cassette Ac:30+ Win. AC2+Tower AC:1+ VRF.AC:5
- Annual maintenance contract is given for ACs.
- List of major consuming equipments/ devices lab instrument in institute are-

- AC, water Cooler, Workshop machineries
- Total no. of coolers used in summer-130 Nos.
- No. of generator set :2 of Capacity: 320KVA, 140KVA
- Total running Hr/Year: 45 Hrs(For 2018)
- Use of LED bulb and energy Saving fans is evident.
- 65.21% of the present bulbs and tubes are converted to LED.
- Expenses incurred ion Electricity is available monthly but not of diesel and petrol.
- Department wise load consumption is not evident. En. Consumption for each building is not estimated.

ACs used are-

Sr.No	Type	Tot. No.
1	Split AC	140
2	Cassette AC	30
3	Window AC	2
4	Tower AC	1
5	VRF AC	5
	Total	**178**

Only 6-7 ACs are 5 star rating ACs. Consumption of energy because of ACs is not estimated. No. of Electrical equipment used & electrical Energy Consumed Equipment wise is not estimated.

Sr.No.	Equipment	Quantity
1	**Computer**	**1933**
2	**Printers**	**203**
3	**3D Printer**	**2**
4	**Xerox**	**4**
5	**Projector**	**115**
6	**Water cooler**	**34**
7	**Air Cooler**	**125**
8	**Generator**	**2(1:320KVA, 2:140KVA)**
9	**Geezers in girls & boys hostel**	**25(Each:3KW capacity)**
10	**No. of Lift in the college**	**04**

Energy consumption details

- No. of LPG Cylinder in canteen:25
- No. of Two Wheeler Vehicle:3500
- No. of Four Wheeler: 125
- No. of Cycle:3
- Pickup vans:4
- Avg. Driving: 2 Wheeler15-25 Km
- Last year Generators run: 45Hrs.
- Total diesel consumption amount Rs.1066358/- for 2017-18
- No. of solar panels installed: 1132Nos of Capacity 340KWP(kilo Watt Peak)

College is able to utilize the full power of solar energy.

Sr. No.	17-18	18-19	19-20
Electrical Consumption	963387 Units	761652 Units	**447401.50 Units**

Following simple ways to reduce electricity consumption can be followed:

1. Don't Leave Electronic Appliances On Standby Mode: It is a common tendency among the people to switch off their electrical appliances using the remote, leaving them on standby mode. They fail to realize that the device is still consuming 85% of electricity energy and

wasting the valuable energy reserve. Instead, by switching off the main power button or by unplugging the socket, they can make a commendable contribution in saving electricity energy.

2. Avoid Using Electric Tumble Dryer: An electric tumble dryer consumes a large amount of electricity energy in a home. To save the exhaustible electrical energy, user must switch over to the traditional method of line-drying the clothes.
3. Lighting: The traditional bulbs and tube lights consume a large amount of electricity energy, making a contribution of almost 10 to 15 percent in the electricity bill. In lieu of these outdated bulbs, one must prefer purchasing an energy saving bulb and the fluorescent tubes that glows brightly without consuming more energy.
4. Bring Home Solar Garden Lights: To lighten your garden and add grace to its look, one can easily bring home the highly efficient solar garden lights as they do not entail you to dig trenches or set up wiring connections. Users can easily arrange these fitting anywhere they desire and highlight the dark areas of their gardens. These lights get charged up during the day and illuminate the garden at night.
5. Check out The Energy Star Label: While purchasing electronic appliances like air conditioner, refrigerator, microwave and other household appliances, one must make sure that the appliance has an energy star label on it that can help to cut almost 30 percent of the electricity bills.

Recommendations

1. All electrical loose wire to be dressed up properly.
2. Electrical Earthing of the college to be checked regularly.
3. Awareness for the use of electricity and paper to be developed in the college.
4. Instruction such as all electrical appliances (lights/fans/AC) shall be switched off when not in use or at the end of the day to be displayed.
5. College takes steps to purchase fans, refrigerators and air conditioners with low energy consumptions with maximum star ratings.
6. College has to replace resistance regulators with electronic regulators, CRT monitors with LED monitors and DOT matrix printers with Deskjet printer.
7. Use of Diesel generator to be avoided (to reduce the consumption of oil , record of consumption of diesel to be maintained.
8. Enhanced renewable energy source capacity.

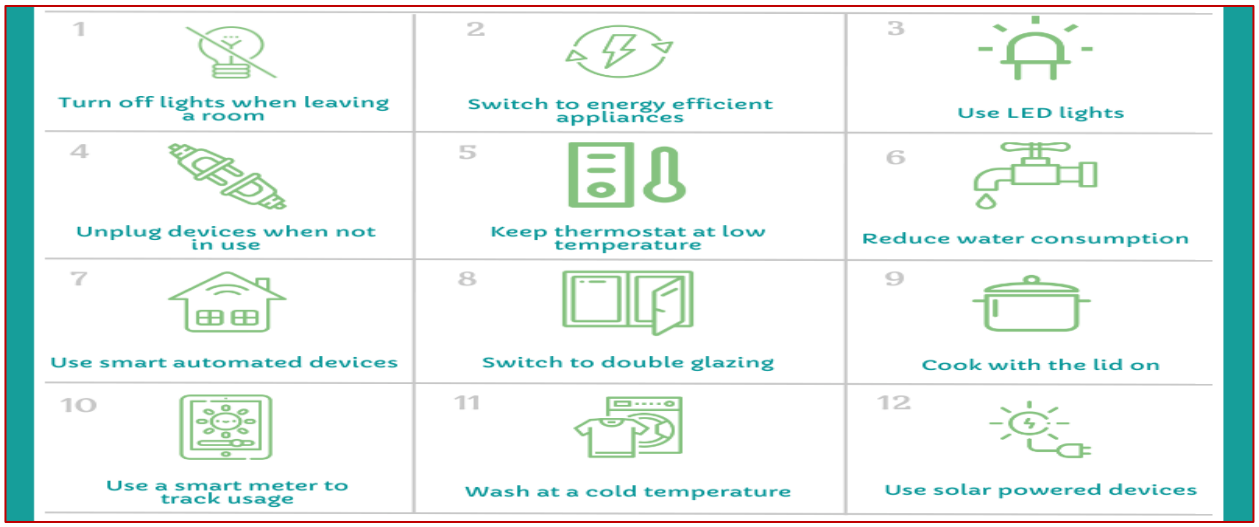
9. The display of the instruction boards/to be displayed on each classrooms/ lab for switching of the fans and lights when not required.
10. Switching to star rating electric appliances in phase wise manner.
11. Carbon Sequestration study shall be carried out before plantation of Green Belt.
12. Energy Consumption for each building should be estimated to design the energy conservation plan.
13. Instead of out-sourcing the Annual Maintenance of Electrical Equipment college concern department staff shall take that responsibility
14. Energy saving awareness shall be done by displaying the boards at appropriate place.
15. List of electrical gadgets used in every section, departments, hostels, canteens to be prepared with electrical capacity required.
16. Encourage natural ventilation and illumination by alteration in the building structures whenever going for new constructions.
17. Think of installation of Morse's lamp near turbo ventilator.
18. Air condition in offices needs to be set on 26oc.
19. All the lifts must have the following legal requirement as
    a. Emergency phone No.
    b. Lift license

Electrical Bills for last 12 months?

Month	Marh 19	Apr 19	May 19	June 19	July 19	Aug 19	Sept 19	Oct 19	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20
Electrical Bill	**924650**	**951140**	**869690**	**616710**	**918330**	**999010**	**949340**	**484570**	**374310**	**326110**	**376360**	**303750**	**259640**

No. of solar panels installed: 1132Nos of Capacity 340KWP(kilo Watt Peak)

Total Energy (Power)Required by the college(kWh)	Power Requirements met by renewable energy Sources	Source of Renewable energy (Solar/Wind)	Renewable energy generated and used	Energy Sold
447401.50	**541928**	**Solar**	**541928**	**281804**



GREEN BELT AREA & BIO-DIVERSITY:

The Green Belt Area is meant for conservation of nature and esthetic value of the college premises, the total area of the plot is 44596.35 m2 . As per the requirement of National Green Tribunal the green belt shall be developed as per the guide lines of Central Pollution Control Board. The area of Green Belt in this College ought to be 14716.8 m2 i.e. 33% of the total plot area. The Green Area in the college includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programme.

The area is immensely diverse with a variety of tree species performing a variety of functions, Sprawling lawn/ garden. Most of these tree species are planted in different periods of time through

various plantation Programmes organized by the authority and have become an integral part of the college. The trees of the college have increased the quality of life, not only the college fraternity but also the people around of the college in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting wildlife, controlling climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer. Many spices of birds are dependent on these trees mainly for food and shelter. Nectar of flowers and plants is a favorite of birds and many insects. Leaf – covered branches keep many animals, such as birds and squirrels, out of reach of predators. Different species display a seemingly endless variety of shapes, forms, texture and vibrant colours. Even individual trees vary their appearance throughout the course of the year as the seasons change. The strength, long lifespan and regal stature of trees, enormous variety of flowering plant, give them a monument – like quality. They also remind us the glorious history of our institution in particular. We often make an emotional connection with these trees and sometime become personally attached to the ones that we see every day. A thick belt of large shady trees in the periphery of the college have found to be bringing down noise and cut down dust and storms This includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards This also helps in ensuring that Environmental Policy is enacted, enforced and reviewed using various environmental awareness Programmes.

Observations

Campus is located in the vicinity of approximately 80 types (species) trees. Various tree plantation programs are being organized during the month of July and August at college campus and surrounding villages through NSS unit. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various types of indigenous species of ornamental and medicinal. Instead of maintaining biodiversity the similar species planted is observed for example "NEEM". The dominant species in green belt are Neem, Pongam Tree, Amaltash, Copepod and Sita Ashok. This Bio-diversity never fulfills the aim of green belt development.

- ➢ Total land area available for plantation.Apprx.10,000Sq.Ft
- ➢ Total land area covered by plantation.5250 Sq.Ft.
- ➢ No. of trees planted in campus.725




Recommendations:

The Management of College may consider on top priority that:-

- The Green Belt is to be developed as per the guidelines of NGT
- Total 33% area is to be reserved for plantation and around 4368 plants to be planted in the area as per the guidelines of the CPCB
- The Biodiversity is to be maintained while considering the plantation in future.
- The selection of trees species to be based on environmental conservation and carbon sequestration value.
- Artificial nests and water ponds are recommended to attract different birds in their migrating and breeding season
- Three Tier Aero-dynamic tree plantation along the boundary of the collage in all direction
- Plant survival rate is to be maintained
- Watering schedule to be planned according the season
- Drip irrigation is strongly recommended to conserve the water
- Reuse of the water shall be done instead of use of fresh water
- The car case of the plant is to be maintained to enhance the esthetic value of premises.

- Special Tree Plantation shall be celebrated every year on environment day and also competitions for bird species identification and knowing the tree values in terms of medicinal and environment conservation.

Air Quality& Noise Quality Monitoring:

Since air quality plays a vital role for good health. Air Quality monitoring instrument is used to monitor quarterly the criteria pollutants. The most important air quality parameters, which are measured, are NO2, SO2& PM10. The other criteria pollutants such as Ozone, Carbon Monoxide and Lead are not measured because there are no nearby Industries located near the institute, which are emitting these pollutants. Noise equally plays a vital role in the environment, hence noise measurement are also done at the institute quarterly.

Waste Management:

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair, and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus. The different solid wastes collected as mentioned above.

For Plastic and waste generated in the college there is a provision to dispose the same with waste collection vehicle of corporation on daily basis under the swatch Bharat Abhyaan. The wastage from the canteen needs to be used in the composting purpose rather than disposing it through other sources.

Also college encourages their staff and students for using the plastic bags of more than 50 micron or use clothes bags or paper bags makes with the waste paper through awareness training.

Solid waste:

The collecting, treating, and disposing of solid material that is discarded because it has served its purpose or is no longer useful. Improper disposal of municipal solid waste can create unsanitary conditions, and these conditions in turn can lead to pollution of the environment and to outbreaks of vector-borne disease—that is, diseases spread by rodents and insects. The tasks of solid-waste

management present complex technical challenges. They also pose a wide variety of administrative, economic, and social problems that must be managed and solved.

The sources of solid waste include residential, commercial, institutional, and industrial activities. Certain types of wastes that cause immediate danger to exposed individuals or environments are classified as hazardous; these are discussed in the article hazardous-waste management. All nonhazardous solid waste from a community that requires collection and transport to a processing or disposal site is called refuse or municipal solid waste (MSW). Refuse includes garbage and rubbish. Garbage is mostly decomposable food waste; rubbish is mostly dry material such as glass, paper, cloth, or wood. Garbage is highly putrescible or decomposable, whereas rubbish is not. Trash is rubbish that includes bulky items such as old refrigerators, couches, or large tree stumps. Trash requires special collection and handling.

Construction and demolition (C&D) waste (or debris) is a significant component of total solid waste, although it is not considered to be part of the MSW stream. However, because C&D waste is inert and nonhazardous, it is usually disposed of in municipal sanitary landfills

Another type of solid waste, perhaps the fastest-growing component in many developed countries, is electronic waste, or e-waste, which includes discarded computer equipment, televisions, telephones, and a variety of other electronic devices. Concern over this type of waste is escalating. Lead, mercury, and cadmium are among the materials of concern in electronic devices, and governmental policies may be required to regulate their recycling and disposal.

Once collected, municipal solid waste may be treated in order to reduce the total volume and weight of material that requires final disposal. Treatment changes the form of the waste and makes it easier to handle. It can also serve to recover certain materials, as well as heat energy, for recycling or reuse.

-Type of waste generated

-1.Plastic Waste:

The plastic are strongly restricted to bring in the college or if brings the same, its thickness shall be morethan 50 micron as per the government rules and regulations. Otherwise in the State of Maharashtra 'Plastic is Ban".

-2. Hazardous Waste;

The chemical hazard which is being generated in the chemical lab is now collected in drum (identified), and neutralized the same before it is being drained to effluent treatment plant. Now days due to Covid-19 pandemic, online classes are carried out. Therefore the amount of chemical waste generation is almost nil. The other hazardous waste is Florescent Tubes and CFL Bulbs, Electrical waste, Laboratory Waste, etc. The disposal plan needs to be prepared.

3. Wooden Waste:

-Damaged Furniture, Wooden Packaging

The wooden policy is being followed. The new purchases in the form of solid wood are not carried out, instead particles boards are used. College has appointed carpenter permanently for repair of old furniture. They used old chair and tables to build and repaired the new chair and tables instead buying any new wood from the market. All the chair and tables, cupboard is now from metal, PVC material with recyclable material.

4. Metal Waste: Scrap Metal, broken utensils, and damaged machinery from Laboratory. Metals if possible reused and scrape out to respective scarp dealer.

5. Non-Biodegradable Waste: - Papers, Plastic Coated Papers ect. The college has framed policies for handling and disposal for these wastes.

6. Food Waste:

The only area from where the food waste is generated is canteen, and hostel mess. The canteens has well displayed importance of avoiding the food waste poster in the canteen. Also if it is noticed that the food is wasted by any person/girls, then the same may be brought to their notice. The food waster generated in the canteen is being transferred to Gaushaala.

7. Biodegradable Waste: - Tree Leaves and biomass produced in garden, uncooked vegetable remaining from Kitchen of Mess and Canteen.

Waste	Quantity Generated/Day
1.Plastic Waste	Avg. 2-3 Kg
2. Hazard Waste	1-2 Ltr
3.Wodden Waste	Avg. 5-7 Kg
4. Metal Waste	Avg.10 Kg
5. Food Waste	Avg.25Kg
6. E-Waste	0.50Kg or 10Tons/Year
7. Batteries	0.10Kg

E-waste:

E-waste is given to the authorized vendor M/S. Suritex Pvt. Ltd. Certificate of e-waste management Form No.6 is provided. Reg. No. MPCB/ROHG/HSMB/AOTLO/16/EW-333 through MPCB wide letter 28.11.2016 valid 19.02.2021 Waste generated in RCOEM:

E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. This makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

E-waste generated in the campus is very less in quantity. The cartridges of laser printers are refilled outside the college campus. Administration conducts the awareness programmes regarding E-waste Management with the help of various departments. The E- waste and defective item from computer laboratory is being stored properly. The institution has decided to contact approved E-waste management and disposal facility in order to dispose E-waste in scientific manner.

Aim and objective:

- E-waste is the future coming environmental problem will create hazards to our environment, it is non-degradable waste can pollute water, soil and air.
- With keeping this view we are aware students and all staff about hazards effect of the e- waste on the health of man and ecosystem destruction, Waste material mainly metal, insulating materials present in the e-waste like CD, scrap mobile like devices, computer waste like

monitor, CPU, mouse, Key board, cable and unused pen drive etc. are coated and deposed in scientific method.

Recommendations:

Activity:

- With keeping view to minimize the pollution created through the e-waste, we have carried out the scientific disposal of e-waste by two ways
- Collection of e- wastes in e- waste box and sale it to concerned firm for its disposal.
- Reuse of the component of unused electronic devices in laboratory viz. Physics.
- Recycle or safely dispose of white goods, computers and electrical appliances.
- Use reusable resources and containers and avoid unnecessary packaging where possible.
- Always purchase recycled resources where these are both suitable and

Observation:

1) Types of waste - paper, plastic, waste books, e waste etc.
2) Data for each type for last 3 years is required to be documented.
3) Paper consumption - collected at separate stores at hostel.
4) Re use of paper – system is evident. Paper recycling is done by both side usages.
5) Garbage - segregated into wet and dry, monitored by security.
6) Garbage – plastic black bags are sent to external agency named 'Email Scrap Centre'.
7) Canteen wet garbage is given to external vendor. (Laxmikant Rajmane)
8) Book recycling is evident by library.
9) Old magazines – from 2010 are evident.
10) Waste collected quantity: Average 100Kg -125Kg.
11) Waste segregation in various dustbins at place
12) College have vermiculture composting of 150 Sq. Ft. capacity

Recommendations:

The management of college can consider the following recommendations on top priority:-

1. The solid waste generated in the collage premises to be collected in scrap Yard (Notified Area) and segregated as per the category of solid waste management and stored in the well labeled area.
2. Plastic waste to be given to either recycler vender registered with Maharashtra State Pollution

Control Board as per "The Plastics Manufacture, sale and Usage Rules, 1999 and all its Amendments.

3. Hazardous Waste to be disposed by identified disposal pathway within 90 days from its generation as per the guidelines of "Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 with all the Amendments.
4. To avoid wooden waste generation the furniture to be transferred from wooden to metallic in future and todays wooden waste shall be reused in the college through carpentry shop of workshop in mechanical engineering department.
5. Metal Waste to be reused in the college and workshop department shall be engaged for it, if they prove that the waste cannot be reused will be sale out to the venders who will recycle and reuse the same.
6. Unused food waste to be used as cattle feed, as on today some unregistered persons take away these waste, the one who uses it shall come regularly and should be registered with the college concern department and its record shall be maintained.
7. Non- Biodegradable waste shall be disposed to the registered vender with Maharashtra State Pollution Control Board
8. Biodegradable waste to be compost in the college premises in technical manner, it is observed that the vermin culture pans are present in the college but in technical institute it is expected that the composting shall be done in perfect technical manner.
9. Municipal Solid Waste to be disposed as per the guidelines "The Municipal Solid Wastes (Management and Handling) Rules, 2000 with its all Amendments.
10. The replaced or used batteries which could not be recharged as the life get exhausted shall be disposed as per the guidelines of "The Batteries (Management and Handling) Rules, 2001 and all its Amendments
11. The E-Waste Produced in the collage to be disposed off as per the guidelines in "E-Waste Management and Handling Rules, 2011 and all its Amendments.
12. The records of proper disposal of all the solid wastes to be maintained with its manifests at one central place.

Carbon Foot Print:

A carbon footprint is a measure of how much someone is contributing to the gases that contribute to global climate change. More scientifically, it is the amount of anthropogenic carbon dioxide (CO2) emissions (those resulting from or produced by human beings) attributable to an individual or a household or an organisation, generally resulting from their direct or indirect use of energy. Although we talk about a 'carbon footprint', it would be more accurate to talk about a 'carbon dioxide footprint'. A carbon footprint is normally calculated in tonnes of carbon dioxide equivalent (tCO2e) but occasionally footprints are calculated in tonnes of carbon equivalent (tC). You will need to multiply by 44 and divide by 12 to convert from tonnes of carbon to tonnes of CO2 equivalent. In this unit we may talk interchangeably about carbon emissions, carbon dioxide emissions and CO2 emissions.

Carbon footprints may also include other gases that contribute to global climate change – the so called 'greenhouse gases' (GHGs). The most common of these is methane (CH4), but they also include nitrous oxide, hydro fluorocarbons, per fluorocarbons and sulphur hexafluoride (SF6). These other gases tend to be produced from agriculture or industrial processes. Most are much more powerful contributors to global warming than CO2. Water vapour (H2O) is also a significant contributor to global warming but, as its concentration varies little with time, it is not considered to be an anthropogenic greenhouse gas, except from aircraft vapour trail. However, the largest contributor to global warming is carbon dioxide itself, which is produced from burning fossil fuels such as coal, oil or gas. As well as the direct use of fossil fuels, people's carbon footprints normally include the use of

electricity (where CO2 is emitted at the power station) and as a result of collective travel, such as on trains, buses and aircraft.

Recommendation:

1. College to identify all its activities.
2. Calculate the carbon foot print.

OVERALL RECOMMENDATIONS:

1. Water meter to be installed at different water sources and plan for providing the same to different buildings particularly at hostels.
2. Environmental policy to be displayed at prominent locations.
3. Environmental objectives to be set in measurable form and to be displayed at prominent location.
4. Environmental data to be displayed at prominent place. These are
   a. No of plantation done last year.

b. Electricity produced through renewable energy source (Solar).
c. Save electricity bill last year etc.

5. Process of E waste to be defined and displayed (for all the E-Waste generated in the college).
6. Room used for storing E-waste to be identified.
7. E-waste generated at different departments other than the computer and its accessories needs to define the sections where these can be stored.
8. Separate identified bins for E-Waste to be placed in hostels and other identified places.
9. Composting area to be properly identified.
10. All Electrical loose wire needs to be dressed up particularly in hostels (girls).
11. Earthing to be check on regular basis at least once in a year and record to be maintained.
12. List of equipments available in departments with electrical capacity to be prepared including , PC, CPU, Printers, Fax machine, Air condition, coolers, fans, tube light etc.
13. Plan for green belt development to be prepared.
14. Drinking water analysis shall be done as per IS 10500.
15. Air quality to be checked for SOx, NOx, PM2.5, PM10 etc.
16. Monitoring of noise level to be done.
17. Ensure that all the vehicles entering into the college has Valid PUC.
18. Department wise electrical load consumption is to be done.
19. Energy used by each appliance is to be estimated department wise.
20. List of equipment/instrument and their consumption of (energy/water) is to be estimated.
21. Awareness for energy and water conservation among students and staff by displaying boards.
22. Disposal of sanitary napkins as per the latest guidelines under solid waste disposal. (As Sanitary pad disposal bags mandatory from January 2021).
23. Tree plantation shall be done to maintain biodiversity as well as artificial nesting shall be installed. Area for plantation other than the college to be identified as the college premises is saturated with plants.
24. D. G. stack monitoring/Exhaust gas analysis shall be done.
25. All the lifts must have Emergency phone No., and lift license displayed in the lift.
26. In HT transformer 11 KV/415 V (630 KVA) there are three earth pits which are covered arrangement of water drop by drop is to be provided at each pits
27. Transformer area must be cleaned.
28. Provision of Morse's lamp near turbo ventilator to be installed as a project.

29. There are 110 AC installed," Optimize setting to 26 degree centigrade" to be displayed except server room and other important room.

ANNEXURE-I SOCIO CULTURE ACTIVITY

PRERNA 12.0

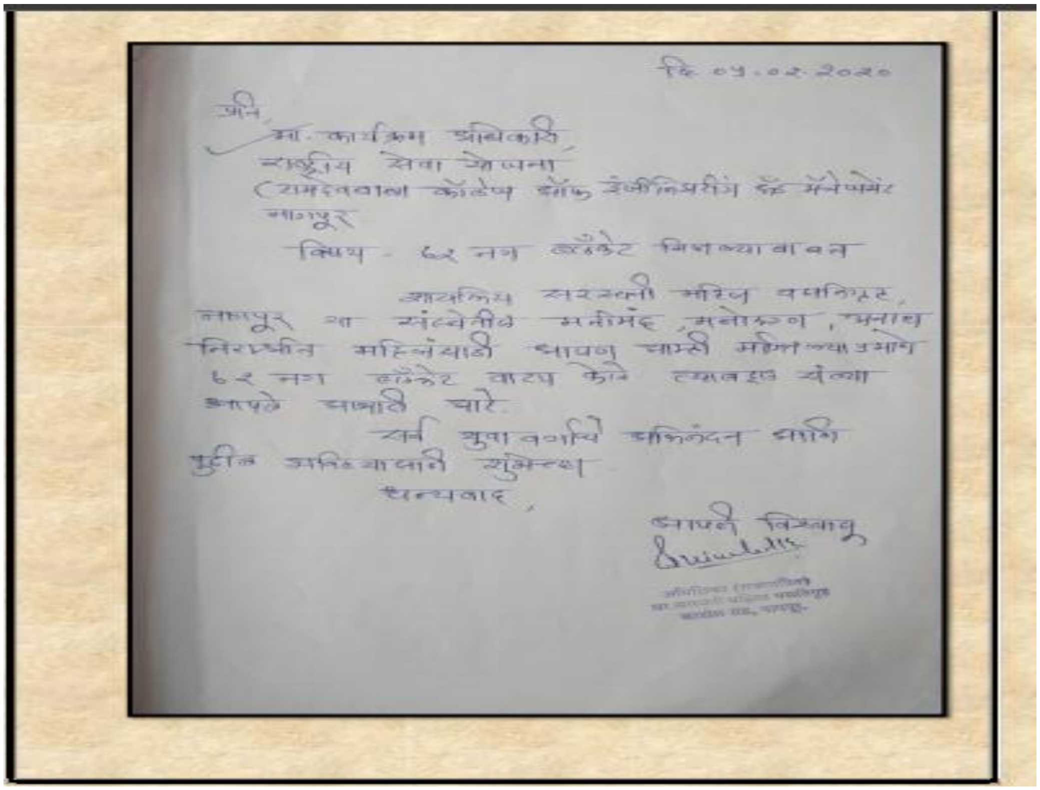
One week long socio-cultural activity 2019-20

(Separate Report Submitted)

100 HOURS OF INTERNSHIP PROGRAMME

SCHEDULE

Sr. No	EVENT	DATE
1.	Introduction to Swatcha Bharat Internship	
2.	Interaction with Sarpanch	26/07/2019
3.	Awareness:	26/07/2019
	a) Water Management.	
	b) Waste Disposal.	
4.	Nukkad Natak	26/07/2019
5.	Cleanliness Drive A	26/07/2019
6.	Wall Painting	27/07/2019
7.	Degradable And Bio-degradable	27/07/2019
8.	Awareness Through Fun	27/07/2019
9.	Paper Bags Making	27/07/2019
10.	Cleanliness Drive B	27/07/2019
11.	Vermi-Compost	28/07/2019
12.	Soak-Pit	28/07/2019
13.	Importance Of Toilet	29/07/2019
14.	Female Sanitization	29/07/2019
15.	Felicitation	29/07/2019



दि. ०५.०२.२०२०

प्रति,
मा. कार्यक्रम अधिकारी,
राष्ट्रीय सेवा योजना
(रामदेवबाबा कॉलेज ऑफ इंजिनिअरींग ॲंड मॅनेजमेंट
नागपूर

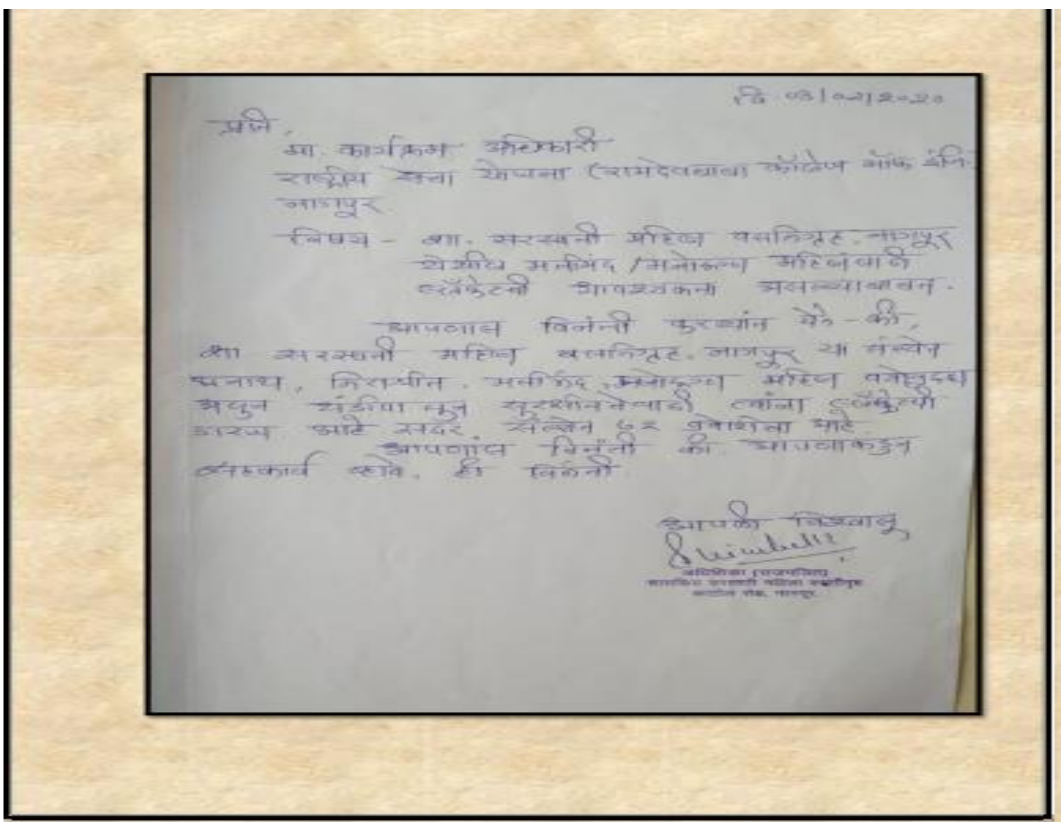
विषय - ६२ नग ब्लँकेट मिळाल्याबाबत

आर्यलिय सरस्वती महिला वसतिगृह, नागपूर या संस्थेतील मतिमंद, मनोरुग्ण, अनाथ निराधार महिलांसाठी आपण आम्ही मागितल्याप्रमाणे ६२ नग ब्लँकेट वाटप केले त्याबद्दल संस्था आपले आभारी आहे.

सर्व युवा वर्गाचे अभिनंदन आणि पुढील उपक्रमासाठी शुभेच्छा

धन्यवाद,

आपली विश्वासू



दि. ०३/०२/२०२०

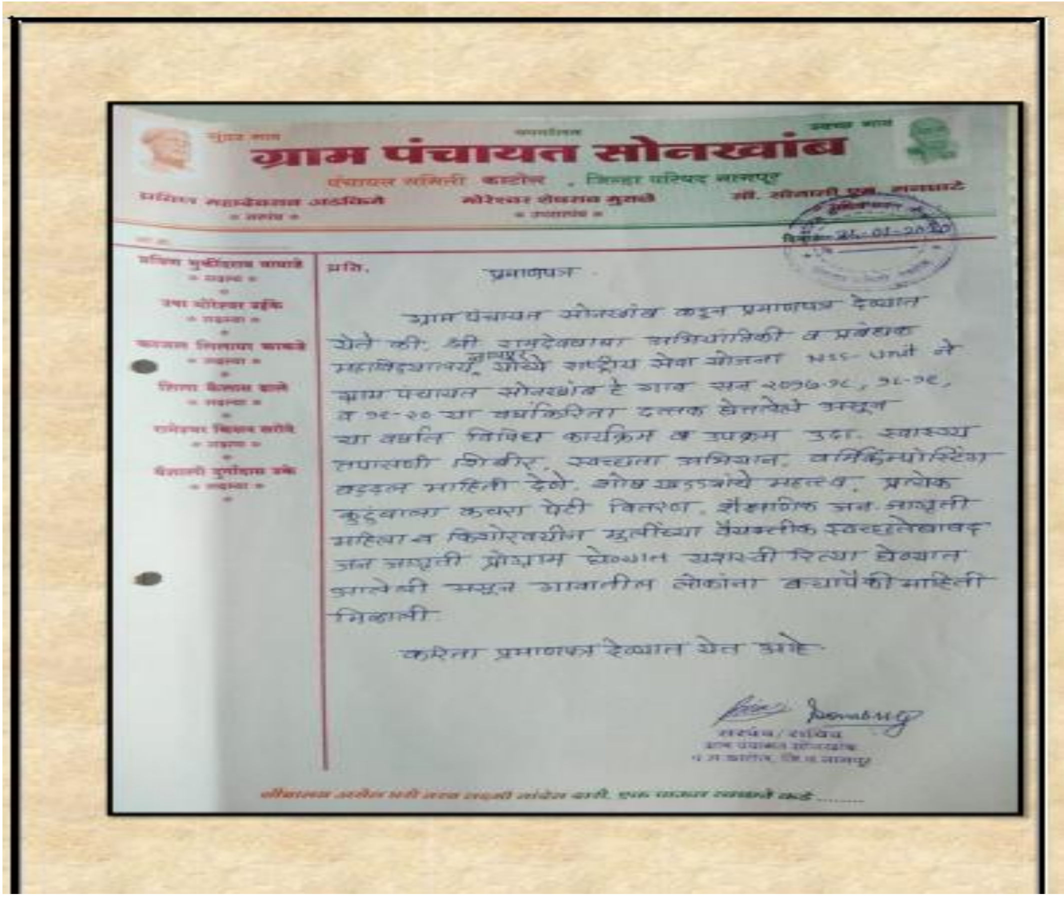
प्रति,
मा. कार्यक्रम अधिकारी
राष्ट्रीय सेवा योजना (रामदेवबाबा कॉलेज ऑफ इंजि.
नागपूर

विषय - श्री. सरस्वती महिला वसतिगृह, नागपूर येथील मतिमंद / मनोरुग्ण महिलांसाठी ब्लँकेटची आवश्यकता असल्याबाबत.

आपणास विनंती करण्यात येते की, श्री सरस्वती महिला वसतिगृह, नागपूर या संस्थेत अनाथ, निराधार, मतिमंद, मनोरुग्ण महिला वास्तव्यास असून थंडीपासून संरक्षणासाठी त्यांना ब्लँकेटची गरज आहे. सदर संस्थेत ६२ प्रवेशिता आहे.

आपणास विनंती की आपणाकडून सहकार्य व्हावे. ही विनंती

आपली विश्वासू



ग्राम पंचायत सोनखांब

पंचायत समिती काटोल , जिल्हा परिषद नागपूर

प्रति,

प्रमाणपत्र

ग्राम पंचायत सोनखांब कडून प्रमाणपत्र देण्यात येते की: श्री रामदेवबाबा अभियांत्रिकी व प्रबंधक महाविद्यालय, नागपूर येथे राष्ट्रीय सेवा योजना NSS- Unit ने ग्राम पंचायत सोनखांब हे गाव सन २०१७-१८, १८-१९, व १९-२० या वर्षाकरिता दत्तक घेतलेले असून या वर्षात विविध कार्यक्रम व उपक्रम उदा. स्वास्थ्य तपासणी शिबीर, स्वच्छता अभियान, वर्मिकंपोस्टिंग बद्दल माहिती देणे, शोषखड्ड्यांचे महत्त्व, प्रत्येक कुटुंबाला कचरा पेटी वितरण, शैक्षणिक जन जागृती महिला व किशोरवयीन मुलींच्या वैयक्तीक स्वच्छतेबाबद जन जागृती प्रोग्राम घेण्यात यशस्वी रित्या घेण्यात आलेली असून गावातील लोकांना बऱ्याचशी माहिती मिळाली.

करिता प्रमाणपत्र देण्यात येत आहे.

सरपंच / सचिव
ग्राम पंचायत सोनखांब
प.स काटोल, जि.प.नागपूर

ANNEXURE-II SOCIAL RESPONSIBILITY AWARENESS

AWARENESS PROGRAMS CONDUCTED BY COLLEGE AS SOCIAL RESPONSIBILITY

BIODIVERSIT AND ENVIRONMENT AWARENESS PROGRAM:

REEF (Shri Ramdeobaba college Engineers for Environment Forum)

The role of engineers in saving environment and affecting sustainable development is very important because engineers can use creativity, technology and scientific knowledge to solve practical problems for conserving environment.

Keeping this idea in mind RCOEM took a small step forward by establishing REEF (Shri Ramdeobaba college Engineers for Environment Forum) on 25th January 2012 with the motto "Engineers with a mission: towards a sustainable environment". The idea is to make the future engineers aware of the environment and it's growing problems that can be taken care off. Engineers play a key role in development and once they're ready to strike a balance between environment and development, environment will stand a chance.

REEF for the past 6 years has been conducting several activities aiming to sensitize the budding engineers towards environment.

OBJECTIVES OF REEF

- To create awareness and take up various activities for the conservation of various aspects of environment.
- To establish active association with various organizations working for environmental conservation.
- To take up various activities for underprivileged children and in the process initiate and ingrain the value of environmental conservation.
- To encourage the development and execution of ideas on role of technology for protection of environment

1. **Team REEF**
2. **Objectives of REEF**
3. **Activities**
   i. **Water Tap Survey**
   ii. **Poster Making Competition**
   iii. **Guest Lecture on Noise Pollution**
   iv. **Nylon Removal Drive**
   v. **Ambazari Cleaning Drive**
   vi. **Bird-watching / Nature Trail**
   vii. **Bird Rescue**
4. **Gallery**

Team REEF:

Dr. S. L. Mudliar Mentor Faculty,

REEF Members/Coordinators

1. Shreya Bharati (EN, 1st Year)
2. Vaishnavi Shinde (Civil, 2nd Year)
3. Aman Singh (Civil, 2nd Year)
4. Anubhav Pachauri (Mech, 2nd Year)
5. Vinayak Dhyani (Mech, 2nd Year)
6. Rishav Dutta (EP, 2nd Year)
7. Raunak Khandelwal (CSE, 2nd Year)
8. Kunal Khandelwal (CSE, 2nd Year)
9. Atharva Sawarkar (CSE, 2nd Year)
10. Apoorv Mandavgane (CSE, 2nd Year)

Objectives of REEF

A. To create awareness and take up various activities for the conservation of various aspects of environment.

B. To establish active association with various organizations working for environmental conservation.

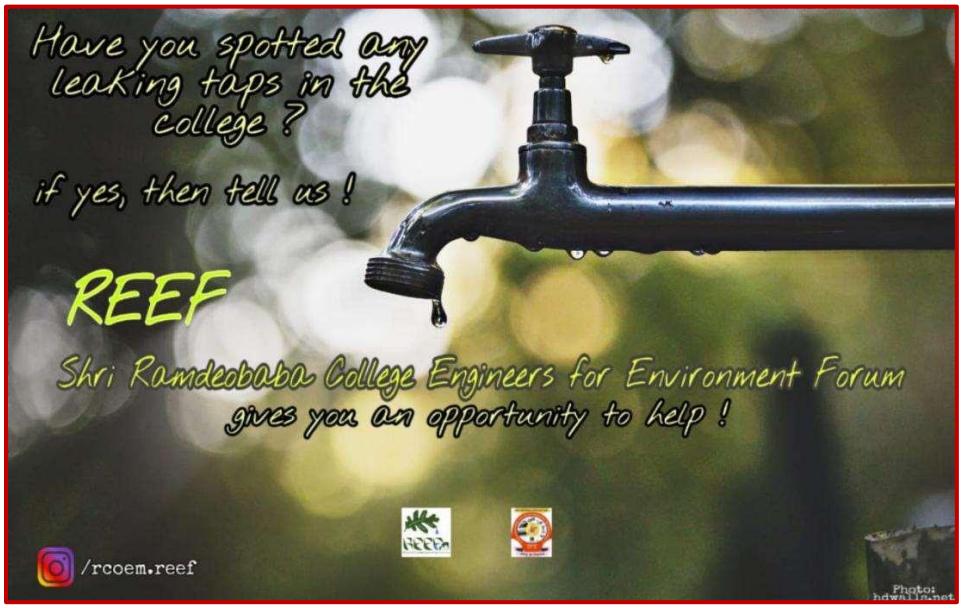
C. To take up various activities for students and in the process initiate and ingrain the value of environmental conservation.

D. To encourage the development and execution of ideas on role of technology for protection of environment.

1. Water Tap Survey

Initiated for a noble cause, the "Digital Water Tap Survey" started on 28th September 2019. It aimed at conserving water, by identifying various leaking taps throughout the campus, and repairing them. The Survey was conducted in an eco-friendly manner, using online forms. The gateway was circulated through social media.

We received multiple reports and complaints, which were directed to the maintenance department for repair.



2. Poster Making Competition

After declaration of "Nation-wide Plastic Ban", it was time to spread awareness.

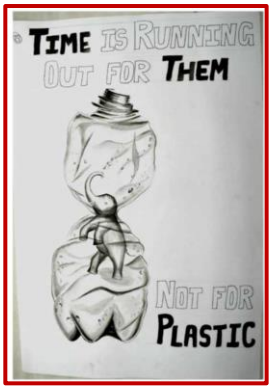
As an interactive activity, A "Poster Making Competition" was organized on 22nd October 2019. The theme was selected as : "Plastic Ban: Harmful effects of Plastic".

The event took place at the Open Air Theatre. It saw participation of some very talented artists of our college. Hence it became difficult for our judges, Dr. S. D. Mohgaonkar and Dr. DeepshikhaMehra, to select the winners.

Winners of this competition were:

Winner **Anchal Yadav**

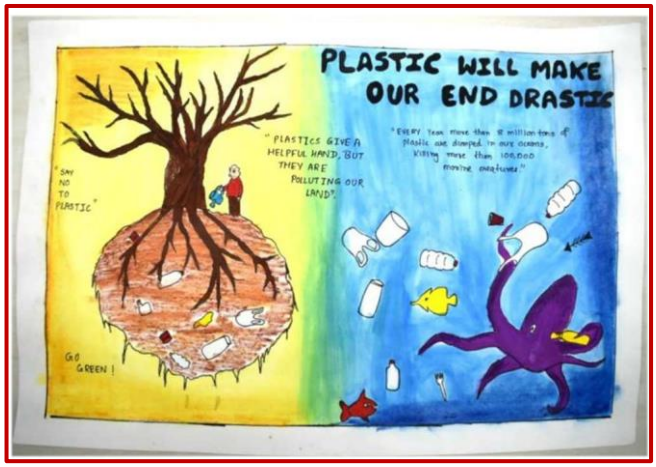
(Civil, 1st Year)



First Runner-up **Shruti Kumbhare**

(EN, 1st Year)

Second Runner-up **Bhagyashree Chilate** (EN, 1st Year)



3. Guest Lecture on Noise Pollution

A prominent NEERI (National Environmental Engineering Research Institute, Nagpur) engineer, Er. Satish Lokhande, was invited to deliver a speech on "Noise Pollution", organized on 21st December 2019, in the Main Auditorium.

He has developed a "Noise Tracker" mobile application, which measures real-time noise level and indicates, whether it is within permissible limits or is exceeding it. He briefed us, and gave a tutorial to use this app.

4. Nylon Removal Drive

Nylon "Manjas" are still used during the Makar Sankranti. It is a hazard to nature, and poses a serious threat to birds.

A Nylon removal drive, "Clean the GREENS", was organized by GroWill Foundation on 19th January 2020. REEF participated and contributed towards this cleaning drive. Various urban jungles were parsed, and large amount of Nylon Manja was collected.

The Bharat Van jungle, Ambazari backwaters, and various other places were selected. Teams were made and sent to each such location to collect Manja. This Manja was then used to manufacture recycled products, and was even used to stuff inside soft toys

5. Ambazari Cleaning Drive

The Forest Department organized Ambazari Cleaning Drive, on the occasion of World Wetlands Day, 2nd February 2020. Various teams of 10-15 people were formed, and each team was allotted an area.

Each team was accompanied by forest officials and rangers, to guide them, as well as for their safety. Large amount of plastic waste was collected from each area, which was sent to recycling plants. Forest officials concluded the event by sharing the information on the biodiversity of the region.

6. Bird-watching / Nature Trail

It is one of the favorite hobbies of nature lovers. REEF members take out time to follow this activity. Most visited spots are Gorewada jungle, Gorewada dam site, ambazari jungle, etc.

With the guidance of experienced bird-watchers, our team is learning the art of identifying birds, and observing their behavior. This activity requires lots of patience.

Usually, weekend mornings or evenings are chosen for bird-watching, as the activity is peak at these times. Common birds, such as Cattle Egret, Green Bee Eaters are spotted easily throughout the year. Some migratory birds, such as Red Crested Pochards, Northern Pintails, Bar Headed Geese, can be spotted in and around the water bodies during winters.

7. Bird Rescue

Multiple incidents have occurred when our team members were informed about injured birds in the campus. We have tried our best, to rescue them if needed. If the injury is minor, and the bird can recover on its own, then it is kept at a secure place.

In case of serious injuries, we take the birds to Transit Treatment Center, where they are treated by certified veterinary doctors.

Poster Making Competition participants, with REEF members

Judges Dr. S. D. Mohgaonkar and Dr.DeepshikhaMehra, with REEF Mentor Faculty, Dr. S. L. Mudliar, Prof. A. V. Bharati, and Prof. Meenal Joshi.

Er. Satish Lokhande, with REEF Mentor Faculty Dr.Mudliar and Chemistry Dept

ORIENTATION

The newly selected REEF members (REEFlings) were taken on a nature trail and bird watching session on 17th September 2017 at Gorewada Biodiversity Park. The orientation of new members to environment started with a walk for bird watching. All the REEFlings were divided into pairs. After the bird watching session each pair of REEFlings was asked to introduce each other. They had to also associate their partner to a bird as a process of knowing each other. REEFlings were also introduced to REEF, its objectives, achievements and activities by chief coordinator Atharva Mangrulkar. They were

also introduced to the five domains of REEF, their objectives and activities by the respective domain coordinators.

AWARENESS AND CONSERVATION ACTIVITIES

GLOBAL TIGER'S DAY 2017

Global Tiger Day (GTD) is marked on 29th July every year to create awareness about decreasing tiger population and its conservation on a global level. This year REEF focused at encouraging schoolchildren to contribute towards tiger conservation. Past 2 years REEF has been organizing an interschool competition on GTD. The competition named as 'How Green Is Your Campus? - Challenges beyond Boundaries' comprised of various activities to inculcate sense of responsibility towards environment and tiger conservation in the young blood. REEFians approached various schools in the city and amongst them 11 schools participated in the competition. All the activities were divided into two categories-'within boundary' and 'beyond boundary'. Both of the categories had some compulsory and some optional activities. Activities like making a wall art, organizing a competition, performing a cultural act, making a digital herbarium, making an awareness video etc. were included under 'within boundary'. And tasks like cleaning campaign, tiger rally, awareness in NMC schools, and research and bird race were included under 'beyond boundary'.

REEF also organized an exhibition, 'Tiger vaganza' on 28th July 2017 in the RCOEM campus. As a part of the competition, schools had to make creative out of waste for the 'Best out of waste' segment. These creative were displayed by the school students in the exhibition. The exhibition also included camera traps for display, wildlife themed tattoo artist, wildlife accessories shop from Pench tiger reserve, wildlife themed delicacies shop and wildlife themed photo booth. On 29th July 2017, the final event of the competition was conducted in MBA auditorium. The winner of the competition turned out to be Centre Point School (Dhaba).

WILDLIFE WEEK

Wildlife week is celebrated all over the country from 2nd to 8th October every year with a view of conserving the flora and fauna of India. For the past two years REEF, the environment club of RCOEM has been actively celebrating the wildlife week with great enthusiasm and zeal.

This year, REEF organized various activities to spread awareness of conserving the wildlife under the theme of IUCN (International Union of Conservation of Nature). An event was organized in college campus on 6th and 7th October for Wildlife week. In the event, wildlife photographs clicked by REEF members in college and during educational tours were exhibited.

MANJHA REMOVAL AT RAJ BHAVAN

REEF members as an annual activity removed manja from Raj Bhavan which is rich biodiversity hotspot and has more than 174 species of birds. Manja that is entangled on tree is a big hazard to the birds of that area. The effort taken by REEF each year is for ensuring bird conservation.

EARTH HOUR

As part of the initiative by WWF, Earth hour is celebrated each year, world over. REEF has been taking part in this endeavor for the past many years. This year through REEF, RCOEM switched off lights during its working hours, students made and distributed paper bags to generate awareness about ill effects of plastic bags, conducted a survey to understand what the plastic usage behavior is. REEF also took part in a campaign taken up by WWF in Sita Buldi area of Nagpur where shopkeepers were requested to switch off lights from 8.30 to 9.30 pm.

BALGRAM (COMMUNITY SERVICE)

Ganesh idol making: The resident children of Blagram made the idol of Ganesh with the help of REEF members.

ELECTIONS AND HERBARIUM ACTIVITY:

Another activity was held on 9th November 2017 in which REEFians conducted elections in Balgram to elect monitors for library, cleanliness, and hygiene. Nominated candidates in each category addressed all the kids before the elections took place. This activity was followed by a herbarium activity on 10th November 2017 in which a tree species was allotted to a kid and a REEFling. The pair had to study about different features of the allotted tree and share it with other groups of REEFling and kid.

BIRDING

Bird baths installation: REEF members installed bird baths on 1st April 2017 at various places in the College campus to fulfill the water requirements of thirsty birds. A total of 14 bird baths were installed. These bird baths are taken care of by the gardening staff along with the REEF members.

The college campus is rich in bird biodiversity and thus it’s a step to conserve it. A video was also made by REEFian Atharva Mangrulkar regarding the activity and posted on the REEF’s Facebook page to spread awareness about the bird baths in College campus, and urged the College students and staff to refill the empty bird baths and also install bird bath at their place to help the birds survive the rising temperatures in the summer season.

Bird rescue: On the morning of 6th April 2017, a baby house swift was found lying on the ground in the Civil Department. Students informed REEF members through a call. After initial assessments, it was found that it had fallen from its nest. The baby swift was cared for and given water while REEFians tried to identify its nest. As soon as the nest was identified, the swift was put back into it by REEFians. On 26th April 2017, two juveniles of Laughing Dove were found to have fallen from their nest in a Lab in Civil Department. REEFians monitored and looked after them until their mother arrived and took care of them. These are few of the many rescues that REEF has done this year. Owing to high temperatures and lack of water, these cases are common in the College campus during summers.

BoV Templates: Templates on body parts of birds, and their families were posted on Birds of Vidarbha (BoV) every week. For this activity, domain members were divided into groups and each group was allotted 3-4 bird families. These templates help the new birders to improve their identification skills and knowledge about bird's ecology. During the quarter templates about the following families were posted on BoV:

- Jacanidae
- Psittacoidea
- Nectariniidae
- Pteroclidaerehabilitate a House swift
- Alcedinidae
- Glareolidae
- Phalacrocoracidae
- Leiothrichidae
- Hirundinidae
- Rhipiduridae

Lessons Learnt: Birding trips were conducted regularly to various birding hotspots in the city like Mihan, Ambazari, Wena and Gorewada Biodiversity Park. After every birding trip, the members shared their observations, experiences and learning about various bird species, their behavior and biology from that trip on the WhatsApp group.

The following trips were conducted in the quarter:

1. Ambazari Backwaters: Birding trips were conducted to Ambazari backwaters on 2ndApril, 14th and 22nd May and 4th June.
2. Gorewada Biodiversity Park: Birding trips were conducted to Gorewada on 4th April and 18th

June.

3. A birding trip was conducted to Degma on 12th June 2017. It is a rich birding hotspot. After birding REEFians discussed about the competition to be organized for schools for Global Tiger Day (GTD).

REEFians never misses a track between photography and birding narrated his experience of shooting the nesting of Indian Paradise flycatcher. He shared how difficult it was when he lacked resources and time. The video he shot told the story of the Indian Paradise flycatcher and its struggle to exist. One beautiful incident he narrated was that, the nest that the female Indian Paradise flycatcher was making was at the cross point of two branches of different trees, and when he found these branches were going apart the other day, he tried to tie them with a twig, and this one attempt gave the bird her nest back!

The seminar was attended by 45 REEF members. It was an interactive session and was knowledgeably interesting at the same time which boosted REEFians interest towards birding. The seminar ended on a happy note and it was appreciated by all.

BIRDING TRIPS:

Birding trips were conducted regularly to various birding hotspots in the city like Ambazari backwaters and Gorewada Biodiversity Park. After every birding trip, the members shared their observations, experiences and learning about various bird species and their behavior on the WhatsApp group.

The following trips were conducted in the quarter:

1. Ambazari Backwaters: Birding trips were conducted to Ambazari backwaters on 1st Oct, 8th October, 5thand 12th November, 10thand 31stDecember 2017
2. Gorewada Biodiversity Park: Birding trips were conducted to Gorewada on 15th October, 3rd, 19thand 24th December 2017

ANNEXURE-IV ONLINE ACTIVITIES:

1. Online quizzes were conducted by the domain coordinators regularly on the domain's WhatsApp group. These are aimed at improving the knowledge of domain members about bird identification from habitat, call and behavior:
2. The first bird quiz was conducted on 14th October on the WhatsApp group. The members needed to identify 10 common bird species from the pictures posted on the group.
3. In the second quiz the members had to identify the bird species and its habitat. It was conducted on 22nd October 2017.
4. The fourth quiz was conducted on 29th October 2017 wherein the members had to identify the bird species and match it with its call. Pictures and calls of birds were posted on the group.
5. The fifth quiz was aimed at identifying bird species living near or in water bodies. It was conducted on 12th November 2017.
6. Online discussions were conducted regularly about different species of birds, their behavior and habitat. On 21st December 2017 an online discussion was conducted on 'Birds as natural indicators'. The importance of different bird species and how they act as natural indicators of changes in the environment were discussed. It was an informative discussion.

PHOTOWALK AT GOREWADA:

During wildlife week, REEFians participated in photo walk organized by Rotary Club of Nagpur in association with FDCM, Nagpur (Forest Development Corporation of Maharashtra) at Gorewada Biodiversity Park.

The photo walk was conducted on 5th October 2017. It started at 6 am at Gorewada Biodiversity Park where participants were allotted 90 minutes to walk in the forest and click photographs. After the photo walk, the participants were asked to mail best 3 photographs clicked by them during the walk. Among all entries panel shortlisted top 10 photographs which will be displayed in forest resorts.

TRANSITION OCTOBER:

An online bird photography competition, 'Transition October Fortnight' was conducted by Birds of Vidarbha (BoV) from 16th to 30th October 2017. Birds of Vidarbha (BoV) is a Facebook forum for bird watchers of Vidarbha region. This competition provided a platform to bird watchers as they shared

bird photographs clicked by them in October 2015, 2016 or 2017 with the hash tag transition October fortnight'.

SALIM ALI BIRD COUNT:

REEFians participated in 'Salim Ali bird count' organized by BNHS (Bombay Natural History Society) and IBCN (Indian Bird Conservation Network) on 12th November 2017. On this day, two teams of REEFians did bird watching at Ambazari backwaters from 7 to 11.30 am and spotted more than 50 bird species including warblers, flycatchers and waders. Special sightings were Red-headed bunting, Siberian Stonechat, Sykes warbler, sulphur-bellied warbler, Tickell's blue flycatcher, Ultramarine flycatcher, Red-breasted flycatcher and Pied bushchat.

MELGHAT BIRD RACE:

REEFians participated in 'The amazing Melghat Bird Race' organized by Melghat Tiger Conservation Foundation on 16th and 17th December 2017. For the bird race, 5 teams were shortlisted out of which 2 teams were of REEF.

REEFians had an amazing experience exploring the wilderness of Melghat Tiger Reserve and learning about its birdlife. Special sightings during the bird race included Forest Owlet, Bar-winged Flycatcher shrike, Indian Nuthatch, Velvet-fronted Nuthatch and Tickell's thrush.

CAMPUS BIODIVERSITY

CAMPUS MONITORING: REEFians monitor the greenery in the college campus once in a week. They have been divided into seven groups for this purpose. The college campus has also been divided into seven patches. Each group is allotted a patch to monitor. They do bird watching for an hour in the morning and evening, once in a week to record the bird species found in the campus. They also monitor the condition of trees

and plants found in their patch. Each group is submits an online response Google form for the respective patch so as to record the monitoring activity. REEF is planning to make a Biodiversity Register of the College and this monitoring activity helps record the bird and tree diversity present in the campus.

TREE NUMBERING:

REEFians numbered the trees as a part of making the Campus Biodiversity Register that would help us

know the status, count, diversity, ongoing changes and factors responsible for the change of the campus green cover. It was the first step that REEF took towards making the biodiversity register of the college campus. The college campus has been divided into 7 different patches. The identification of the trees

was done with the help of PDF guide of trees. More than 1000 trees were numbered which included Neem, Common white frangipani, Mango, Guava, Sweet orange, Gulmohar, Copperpod, Yellow bells, Teak, Banyan, Ashok etc. REEF members, in the process learned the bark, leaf patterns and shapes, inflorescence of various new species of plants. In the process REEFians gained knowledge about tree identification.

SEASON WATCH:

To track the climate changes, REEFians started Season Watch i.e. collecting information about the climate changes before it becomes hard to respond the change. The environmental issues are result of such changes. As the climate changes, its effect is seen on plants too. To track the changes supported by proof and data.

SOCIAL OUTREACH

Instagram account: Regular Posts were made on REEF's Instagram account created on 2nd February 2017. The objective behind it was to reach out to more people and spread awareness about various environmental issues. It has also helped in creating awareness about REEF and its activities as an environment club so as to encourage masses in doing their bit towards conserving nature and protecting our environment. The posts made on Instagram included past activities, college level events, photographs captured during birding sessions, etc.

Facebook Page: Following were posted on REEF's facebook page to spread general awareness about various environmental issues and festivals:

- Video about' Genetic Pollution' on 2nd April
- Templates about noise pollution and Ram Navami festival on 4th April
- Templates on World Migratory Bird Day on 10th May
- Templates on World Biodiversity Day on 22nd May
- Templates on World Environment Day on 5th June
- Templates on World Oceans Day on 8th June
- Templates on Global Wind Day on 15th June

ANNEXURE-V

LIST OF BIRDS SPOTTED IN & AROUND RCOEM

1 Ashy Prinia	53 Red Wattled Lapwing
2 Asian Koel	54 Red-rumped Swallow
3 Asian Pied Starling	55 Red-Throated Flycatcher
4 Barn Owl	56 Red Avadavat (Red Munia)
5 Baya Weaver bird	57 Rock Blue Pigeon
6 Black Drongo	58 Rose ringed Parakeet
7 Black Kite	59 Rosy Starling
8 Black Redstart	60 Rufous Treepie
9 Black Shouldered kite	61 Scaly-breasted Munia
10 Blyth's Reed Warbler	62 Shikra
11 Brahminy Starling	63 Small Minivet
12 Brown Rock Chat	64 Spotted owlet
13 Cattle Egret	65 Verditer Flycatcher
14 Chestnut Starling	66 White Throated Fantail
15 Common Hoopoe	67 White Browed Wagtail
16 Common Iora	68 White-throated Kingfisher
17 Common Kestrel	69 Wire-tailed Swallow
18 Common Myna	70 Yellow eyed babbler
19 Common Rosefinch	71 Yellow Wagtail
20 Common Tailor bird	72 Yellow-footed Green Pigeon
21 Coppersmith Barbet	73 Indian Scops Owl
22 Dusky Crag Martin	74 Common Chiffchaf
23 Golden Oriole	75 Common Kingfisher
24 Greater Coucal (crow pheasant)	76 Red naped Ibis (in flight)
25 Green Bee-eaters	77 Common Hawk Cuckoo
26 Greenish Warbler	78 Grey Bellied Cuckoo
27 Grey Wagtail	79 Indian Peafowl
28 House Crow	80 Grey Francolin
29 House Sparrow	81 Paddy Field Pipit
30 House Swift	82 Rufous tailed Lark
31 Indian Grey Hornbill	83 Indian Cormorant (in flight)
32 Indian Pond Heron	84 Spotted Dove
33 Indian Robin	85 Yellow Crowned Woodpecker
34 Indian Roller	86 Common Woodshrike
35 Indian Silverbill	87 Brown Shrike
36 Indian Spotted Eagle	88 Bay-Backed Shrike
37 Jungle Babbler	89 Ashy Drongo
38 Laughing Dove	90 Black Naped Monarch
39 Lesser Goldenback	91 Rufuous Treepie
40 Little Egret	92 Cinnerious Tit
41 Long tailed Shrike	93 Black-lored Tit
42 Orange-Headed Thrush	94 Ashy-Crowned Sparrow Lark
43 Oriental Magpie Robin	95 White Browed Bulbul
44 Oriental white eye	96 Red Breasted Flycatcher
45 Pied cuckoo	97 Zitting Cisticola
46 Pied Kingfisher	98 Booted Warbler
47 Plain Prinia	99 Syke's Warbler
48 Plum headed parakeets	100 Sulphur Bellied Warbler
49 Purple Heron	101 Lesser Whitethroat
50 Purple rumped sunbird	102 Ultramarine Flycatcher
51 Purple Sunbird	103 Tickell's Blue Flycatcher
52 Red vented Bulbul	104 Grey-Headed Canary Flycatcher

ANNEXURE VI

RCOEM: ENERGY SAVING UTILITY DATA

1.Details of connected load

Name of the block	Tube lights 60W each	Fans 60W each	Water coolers 300W each	AC 2500W each	Computers 200W each	Total CL
Administration	175	75	3	75	120	
G Block	100	45	3	2	25	
B block	100	60	3	8	50	
K Block	80	65	3	1	20	
EE/IE/ME Block	150	90	4	10	60	
MCA Block	65	25	2	6	25	
CS/IT/EC Block	200	125	3	15	200	
Hostel A	100	75	5		2	
Hostel B	100	75	5		2	
Girls Hostel	80	55	5		2	
Total Qty	1150	690	36	117	506	
Load in Watt	69000 W	41400 W	10800 W	292500 W	101200 W	**514.9KW**
Water Pumps						**20KW**
Street Lights						**10KW**
MBA Block						**65KW**
Total Connected Load						**609KW Say610KW**

Sanctioned Contract Demand:-	**350KVA**
Additional Contract Demand:-	**125KVA**
Total Contract Demand:-	**475KVA**

2.Existing Environment Working Sheet

Heat Dissipation					Comments
Sr. No.	Particulars	Qty	BTU/HR	Total BTU	**Heat Dessipated by PCs is considered equivalent to that of dell optilex 3080 MT - 1338 BTU/Hour**
1	Heat Dessipation by PCs/HR	10	1338	13380	**Heat Dessipated by Servers is considered equivalent to that of dell Poweredge T110 -1300 BTU/Hour to match current servers. 3080 MT - 1338 BTU/Hour**
2	Heat Dessipation by Servers/HR	3	1300	3900	
	Total Heat			17280	

3.Air Conditioner and Heat Dissipation

Particulars		Per Hour		
1	Total Heat Dessipated	BTU/HR	17280	
2	AC Tonnage to cool the heat	Tons	**1.44**	**One Ton of Refrigerent cooling is 3.5168525KW**

4.Power Consumption (running load)

Sr. No.	Particulars	Qty	Power consumption in KW	Total power consumption / Hour	Power Consumption per day (Units)	Power Consumption per year (Units)	Electricity Unit Rate in INR	Total cost per year
1	PCs as servers	10	0.1	1	24	8760	8.41	**73,671.60**
2	Servers	3	0.6	1.8	43.2	15,768.00	8.41	**1,32,608.88**
3	Power Consumption of AC	1	5.06	5.06	121.54	44,362	8.41	**3,73,092.70**
			Total Power Consumption Per Year					5,79,373.18

5. Solar Generation Approx. Benefit Sheet

Sr. No.	Month & Year	Solar Units Generated	Solar Expert Units	Approx. Amt.of saving in Elect.Bill
1	Nov-17	4615	10	**42,000.00**
2	Dec-17	9530	210	**86,727.00**
3	Jan-18	9824	105	**99,618.00**
4	Feb-18	9195	25	**93,244.00**
5	Mar-18	10708	110	**1,08,586.00**
6	Apr-18	11492	0	**1,16,191.00**
7	May-18	9698	5	**98,051.00**
8	Jun-18	9139	150	**95,049.00**
9	Jul-18	5756	10	**60,165.00**
10	Aug-18	6935	5	**72,126.00**
11	Sep-18	4094	90	**44,952.00**
12	Oct-18	3400	10	**37,332.00**
13	Nov-18	9678	783	**1,05,010.00**
14	Dec-18	23530	540	**103023.5**
15	Jan-19	26640	10930	**421075.63**
16	Feb-19	21234	6788	**233530**
				18,16,680.00

6. Overall Lighting Through LED BulBS in Campus

Sr. No.	Particulars Of equipment	Rating	Quantity	Total Wattage	In KW
1	Lighting of T5 LED Tube Lights	22 Watts	764	29,796.00	**29.7**
2	LED Tube Light (2Feet Length)	10 Watts	60	600.00	**0.6**
3	LED Flood Lights in High Mast	150 Watts	52	7,800.00	**7.8**
4	Street Lights LED Floods in Campus (Diff. watts)	100+60+50+10 Watts	39	2,730.00	**2.7**
5	LED Down Lighter	15 Watt	150	2,250.00	**2.2**
6	L Down LighterED	9 Watts	70	630.00	**0.6**
7	LED Down Lighter (2*2)	36 Watts	40	1,440.00	**1.4**
	Total upto Dated 20/12/2018				45KW

7. Electrical Energy Bill Details

Sr. No.	Month	Units Consumed	Amount in Rs.	Renewable Energy Generated Units	Solar Export Units	Month	Units Consumed	Amount in Rs.	Renewable Energy Generated Units	Solar Export Units

1	17-Jan	63710	6,90,587.00			18-Jan	55,725.00	6,01,650.00	9,824.00	**105**
2	17-Feb	67670	7,27,669.00			18-Feb	55,015.00	5,94,930.00	9,195.00	**25**
3	17-Mar	95010	9,89,067.00			18-Mar	85,587.00	8,78,560.00	10,708.00	**110**
4	17-Apr	117025	11,40,449.00			18-Apr	1,03,355.00	10,05,060.00	11,492.00	**0**
5	17-May	107440	12,37,615.00			18-May	1,10,502.50	11,86,690.00	9,698.00	**5**
6	17-Jun	61590	7,09,246.00			18-Jun	48,387.50	5,46,990.00	9,139.00	**150**
7	17-Jul	81660	7,97,526.00			18-Jul	70,350.00	7,26,720.00	5,756.00	**10**
8	17-Aug	97525	10,02,103.00			18-Aug	84,087.00	8,68,720.00	6,935.00	**5**
9	17-Sep	103810	10,26,051.00			18-Sep	87,172.00	19,30,360.00	4,094.00	**90**
10	17-Oct	88620	8,04,250.00			18-Oct	89,342.00	21,54,820.00	3,400.00	**10**
11	17-Nov	64945	6,52,440.00	4,616.00	10	18-Nov	47,830.00	14,65,310.00	9,678.00	**783**
12	**17-Dec**	**44445**	**4,72,780.00**	**9,539.00**	**210**	**18-Dec**	**42,259.00**	**14,78,330.00**	**9,190.00**	**540**

Total units consumed from Jan -17 - Dec 17	**9,93,450 KWH**	**Total units consumed from Jan - 18 - Dec 18**	**8,37,353 KWH**
Average for Jan-17 - Dec - 17	82,787 KWH	Average for Jan- 18- Dec - 18	**76,123 KWH**
Total Renewable energy generated	14,146 KWH	Total Renewable energy generated	**89, 919 KWH**
Total Renewable energy Export to Grid	**220 KWH**	**Total Renewable energy Export to Grid**	**1293 KWH**

Worked on Experienced Basis :Solar Collector dish (Mess) Generator 5-6 load pressure(used for boiling purpose) included to cook approx. 350-300/day and year aim to reduced 2000 kg of LPG consumption.(consolidated in month before).

********** END OF REPORT**********