

ENVIRONMENT, ENERGY & GREEN CAMPUS AUDIT



Mohamed Sathak College of Arts & Science, Chennai.



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MOHAMED SATHAK COLLEGE OF ARTS AND SCIENCE



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Chapter I

Executive Summary

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of higher educational institutions. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. Green 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. To find out the environmental performance of the educational institutions and to analyze the possible solutions for converting the educational campus as eco-campus the conduction of Green Auditing of institution is essential.

Initially a questionnaire (see annexure A) survey was conducted to know about the existing resources of the campus and consumption pattern of the students and staffs in the college. In order to assess the quality of water, samples were collected from different locations of the college campus and analyzed for its parameters. An online “Environmental Awareness Quiz” of MCQs pertaining to topics in all 5 assessment areas was conducted for students and staff (see Annexure A). Collected data were analyzed and conclusions made. Finally a report pertaining environmental management plan with best practices, suggestions and recommendations on the Environmental, Energy and Green campus are documented.



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Background

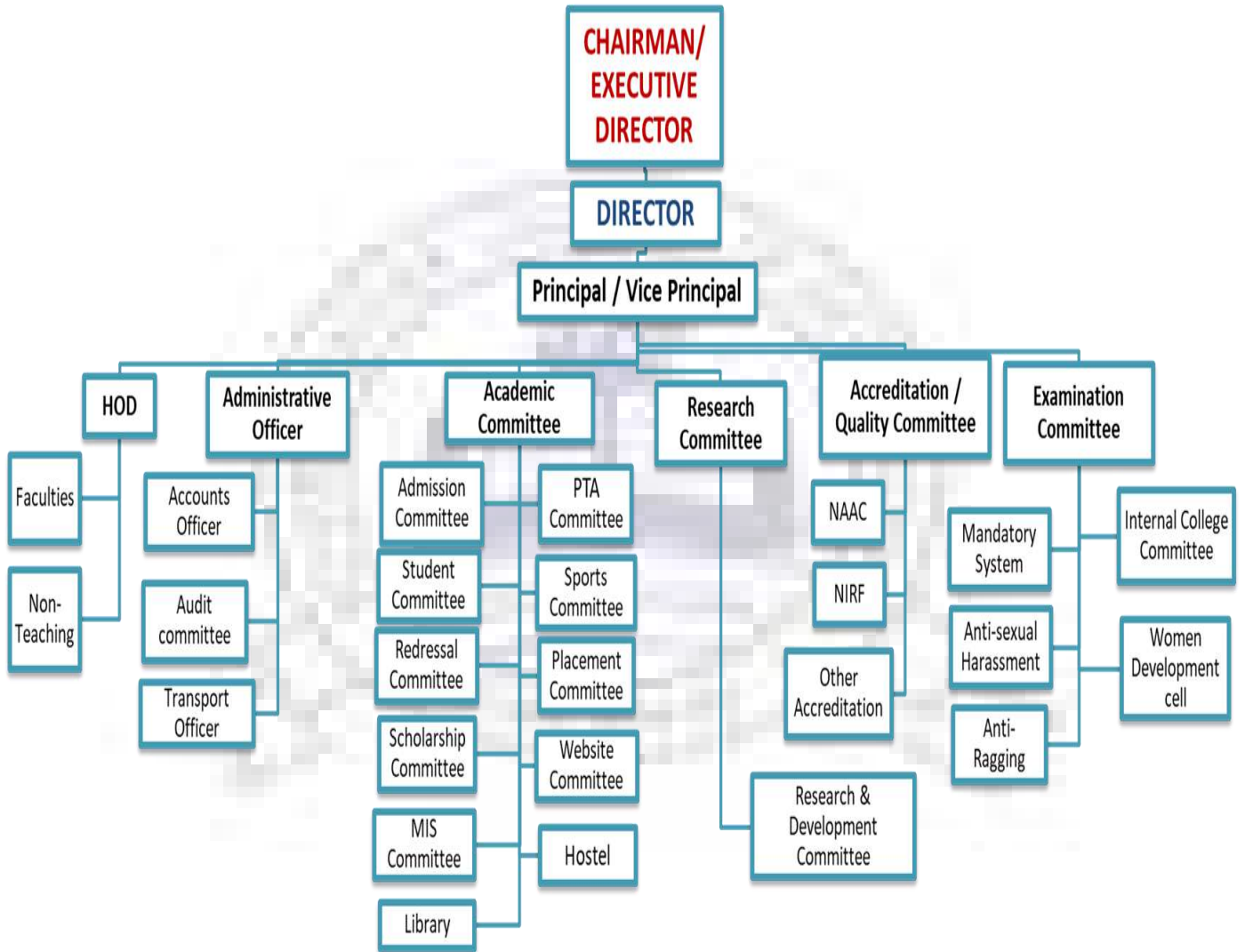
The Mohamed Sathak Trust established in 1973, registers under society's registration act by Philanthropic Mohamed Sathak family of Kilakarai, Ramanad District, TamilNadu with the noble purpose of helping deprived people from rural and financially challenged background to pursue quality education. The founder Chairman Late Alhaj S.M .Ahamed Jalaluddin motivating force behind the establishment of trust which provide quality education with academic excellence in the field of Engineering & Technology, Architecture, Arts and Science, Paramedical and Management education and training to meet the industrial and societal needs. At present, the trust is running 17 institutions such as Polytechnic, ITI, Arabic, Architecture, Engineering, Teacher Training Institutes, Paramedical courses, Arts& Science colleges and Schools located at Kilakarai, Ramanathapuram and Chennai.

Mohamed Sathak College of Arts & Science (MSCAS) was established in 1991, by the Mohamed Sathak Trust with the sole aim of spreading quality education. A coeducational institution it is affiliated to the University of Madras, and approved by the AICTE. The College situated in Sholinganallur, Chennai on the IT corridor. It offers 19-Undergraduate, 8-Postgraduate, 2-Diploma courses and 3 Research programmes (M.Phil & Phd). The courses offered reflect the vast career options today available to the youth, and the curriculum is designed to make them employable the moment they complete the courses and face corporate challenges with the right skills.



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Organogram of the Institution



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❖ VISION

Our vision is to be a global education leader, providing innovative, excellence-driven teaching, research, and service for impactful, ethical living. We aspire to equip students with 21st-century skills, fostering critical thinking, logical reasoning, effective communication, and creativity. Through ongoing innovation, we reimagine the educational experience, exceeding international standards for transformative learning.

❖ MISSION

- **Accessibility:** Easy access to higher education and job opportunities for all
- **Holistic Development:** Foster integrated personality growth among youth.
- **Leadership Preparation:** Prepare future leaders through interdisciplinary experiences, creative and outreach activities.
- **Diverse and Inclusive Environment:** Provide a diverse learning environment for academic and professional success.
- **Critical Thinking and Communication:** Educate students to be critical thinkers, effective communicators, and responsible citizens.
- **Excellence in Teaching:** Encourage excellence in teaching through diverse academic programs.
- **Research:** Engage in renowned programs of research and scholarship

❖ ENVIRONMENT POLICY

The Institution has facilities and initiatives for:

7.1.2 Alternate sources of energy and energy conservation measures

7.1.3 Management of the various types of degradable and non-degradable waste

- ❖ Water conservation
- ❖ Green campus initiatives
- ❖ Disabled-friendly, barrier free environment




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Policy Document of the Institution

Scope

- To promote a sustainable campus environment that encourages ecological well-being, conserves resources, and promotes responsible stewardship

Objective

- The college's Environment club was founded in 2018 with the goal of encouraging a sustainable environment by implementing green initiatives and practices to improve the living environment.
- To raise awareness about environmental issues by organizing Events, Rallies, Awareness Campaigns, Cleanliness Drives, Seminars, Workshops, presentations, Tree Plantation Drives, Excursions, Study Tours & Guest Lectures, etc.
- To place awareness boards, promoting energy and water conservation in all common areas by NSS campaign.
- To enhance the effective utilization of resources like energy and water, while reducing consumption and waste by recovering and recycling whenever feasible.
- To promote the green initiative electric charging socket is installed inside the campus.
- To cultivate a large number of plants that producing quality of oxygen.
- To create awareness about application of rainwater harvesting among students.
- To ensure that more number of saplings planted in the campus.
- To communicate inside the campus, through e-mail or e-messages
- To eradicate the use of plastic inside the campus.
- The terms used in the policy have meaning mentioned in chapter I of the rights of the persons with disability Act 2016.
- To provide accessible and inclusive education at the institute.

Green / Environmental Club

- Environmental club Convener and Members
- Student Co-coordinators
- Gardener



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Roles & Responsibilities

- Promoting environmental awareness and education among members and wider community.
- Organizing events, campaigns, and activities to support sustainability and conservations.
- Frequently organize a campus clean-up drive.
- Monitoring and Maintaining records required for audit purpose.

Process

- Alternate source of energy and energy conservation measures
- Conserving energy by setting up solar panels, LED bulbs in the campus.

Management of Degradable and Non-degradable waste

- As sustainable development focuses on the waste management system, the institution has adopted various measures to manage solid and liquid waste generated on campus, following proper disposal methods so as to keep the campus clean and hygienic.
- Bins of different colors are placed at various points on campus for the disposal of Bio-degradable and Non-biodegradable waste.
- The biodegradable waste, especially paper, is sent to the vendor for recycling, and the non-biodegradable waste of plastic and metals is sorted and disposed of.
- The total solid waste collected on campus from tree droppings, cups, papers, etc. The waste is separated at the source by providing separate bins for biodegradable and plastic waste.
- Single-sided papers are reused for printing and rough writing in all departments.
- Sanitary napkins are disposed of using the incineration process. The sanitary napkin vending machine and napkin incinerator are placed in the student's washroom for the hygienic disposal of the sanitary pads.
- The vermicomposting unit is set in on campus as a part of the Environment Club activity of the college. The leaf litter (biodegradable waste) generated in large quantities is collected in the vermicomposting unit for the purpose of generating organic manure.
- The compost harvested is utilized as organic manure for the plants on campus on a regular basis.




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- The biomedical waste generated from the departments of Biochemistry, Biotechnology, Microbiology and Health clinic are treated locally, and the syringes are incinerated before being disposed of.
- There are no hazardous chemicals used except a few, which are disposed of in the right way after prior dilution, and no radioactive waste is generated on the college campus.
- E-waste generated in the institution is collected and disposed of in the proper manner. Not working computers, printers, and monitors are discarded and scrapped in a proper manner. Students learn and create awareness and education about E-waste.

1. Water Conservation

- Wells and bore wells are the two major sources of water. Water is used for canteens, laboratories, toilets, cleaning, and drinking purposes.
- The college has implemented rainwater harvesting within the campus for storage and reuse and it has reduced its dependence on water tankers, saving lakhs rupees every year.
- The water is treated in the RO plant, which has capacity of 3000 liters/hour. Gardens are water using sprinkler irrigation system to save water. Displays of posters and signboard are done for the implementing the awareness in Hostels and college campus.
- Ban on single use plastic is practiced and hence there is very minimal plastic waste generated. The college canteen minimizes plastic and paper waste by using steel utensils.

2. Green Campus Initiatives

- Encouraging both students and faculty to increase tree planting and convert the campus into a trash and plastic-free zone.
- The students and faculty are encouraged to plant more trees and make the campus a garbage and plastic-free zone.
- Tree plantation programs help in encouraging an eco-friendly environment, which provides pure oxygen within the institute and raises awareness among the students.
- The club creates awareness about global environmental issues like ozone depletion and pollution hazards through seminars and workshops.
- The illumination and air circulation in classrooms are adequate considering the natural light and air velocity present.





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DIVYANGAN POLICY

POLICY FOR PERSONS WITH DISABILITIES

The Rights of Persons with Disabilities Act, 2016, prohibits discrimination against individuals with physical and mental disabilities. The Policy has been prepared to ensure that all members of Mohamed Sathak College of Arts and Science are aware of the facilities provided for the people with disabilities. All institute officials are working hard to assist individuals with disabilities and ensure the advantages of campus programs, services, and events.

- Examination assistance: - Facilitating the differentially-abled students with scribe, if required, during the university examinations.
- Ramps and elevators: - Providing easy access for people with mobility impairments with Ramps, lift, signage board and help desk for assistance.
- Wide corridors and doorways:- Allowing easy passage for wheelchairs and mobility aids.
- Accessible restrooms:- With grab bars and lowered sinks
- Assistive technology:- Providing tools audio loops and braille software and screen readers.
- Inclusive programming and activities:- Encouraging participation and inclusion in all events and activities.
- Continuous improvement:- Regularly assessing and improving the environments to meet evolving needs.

The Faculty work in harmony with the students

- They help in the development of their character
- Counsel and guide them and gradually infuse values of life
- Encourage out-of-the-box thinking

Collaborate with industries and help students to link what they study with real life situations, to make their learning stronger



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HIGHLIGHTS

- MSCAS has produced thousands of Quality and Employable Graduates.

Infrastructure Facilities

Physical Structure	Total - in acres	Departments	Sq. ft	Nos
Area of campus	10.3	Laboratories	18382.6	34
Built-up Area	3.8394	Conference halls	387	3
Under Green cover	2	Libraries	4936.3	3
		Auditorium	5208.4	1
		Canteens	402.15	1
		Class rooms	1420.56	110

Students and Faculty

The student and faculty strength of the college

Category	Male (in Nos)	Female (in Nos)	Total (2023-24)	2022-23	2021-22	2020-21
▪ Students	2312	1091	3403	3762	4154	4519
▪ Teaching staffs	51	98	149	164	150	160
▪ Non-teaching staffs	28	13	41	45	42	41
Total	2391	1202	3593	3971	4346	4720

Hostel & Play areas	Sq. ft	Nos
○ Boys	87209	1
○ Girls	350325	1
○ Play areas - indoor	1800.36	1
○ Play areas - outdoor	10369	1

Facility	Available? Yes/No
Ramps	YES
Lifts for easy access	YES
Disabled friendly washrooms	YES
Tactile path	NO
Display boards/ Sign posts	YES
Human assistance reader/ scribe	YES
Add other facilities for the disabled, if any	

Note: The institution has disabled-friendly, barrier free environment:




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Academic Courses (2023-24)

Under Graduate		Post Graduate	
B.Sc	Computer Science	M.C.A	Master of Computer Application
BCA	Bachelor of Computer Application	M.Sc	Computer Science
B.Sc	Microbiology	M.B.A	Master of Business Administration
B.Sc	Biochemistry	M.Sc	Applied Microbiology
B.Sc	Biotechnology	M.Sc	Biochemistry
B.Sc	Hotel and Catering Management	M.Sc	Biotechnology
B.Sc	Visual Communication	M.Sc	Applied Electronics
B.Sc	Electronics & Communication Science	M.Sc	Mathematics
B.Sc	Mathematics	M.Com	Commerce
B.Com	General	M.Phil. & Ph.D.	
B.Com	Accounting and Finance	M.Phil	Biotechnology
B.Com	Information System Management	M.Phil	Microbiology
B.Com	Computer Applications	M.Phil	Biochemistry
B.Com	Corporate Secretary ship	Ph.D.	Biotechnology
B.Com	Banking Management	Ph.D.	Microbiology
BBA	Bachelor of Business Administration	Ph.D.	Biochemistry
B.A	English	Evening College Courses (Shift II)	
B.Sc	Chemistry	B.Sc	Computer Science
B.Sc	Home Science- Clinical Nutrition & Dietetics	BCA	Bachelor of Computer Application
Post Graduate Diploma		BBA	Bachelor of Business Administration
1	Gene Manipulation Technology	B.Com	General
2	E-Business Management (for M.B.A)		




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A separate hostel for boys and girls is provided. The hostel has a capacity to accommodate 200 students. The spacious mess with a dining hall is provided and kitchen to ensure hassle free eating to the students. Separate seating arrangements have been made for both boys and girls. The hostel mess is run under the supervision of the Management through a private contractor under the guidance of the Principal and the Administrative officer. The parents and the guests are allowed to take food on payment basis.

INTERNET

The college has high speed internet system LAN connected broadband with a speed of 10mbps. The center also provides scanning and printing facilities. The center is accessible 24 hours free of cost for both the staff and the students.

LABORATORIES

The college has multi stored buildings with spacious classrooms and the following well equipped laboratories to cater to the needs of the students.

1. Biotechnology
2. Microbiology
3. Bio-chemistry
4. Chemistry
5. Language

SPORTS

- The college provides excellence in organizational infrastructure, facilities and coaching to students from all backgrounds to reach their full potential through sport performance.
- To develop sports skills, college provides excellent infrastructure in outdoor and indoor games to build strong sports team.

TRANSPORT

MSCAS is located close to Chennai city with well-connected public transportation system.

The college operate 10 college buses that covers nearly all the points from the city.



A handwritten signature in black ink, appearing to read "Dr. H. Abirami".

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Chapter II

Management Commitment

The Management of the college has shown the commitment towards green auditing during the pre-audit meeting. They were ready to encourage all green activities. The college had already taken several measures to protect environment such as awareness programs on environment, campus greening, solar power plant, plastic ban, rain water harvesting, proper disposal of wastes etc. The management of the college was willing to accept any further recommendations from the audit team with respect to policies, compliances, enhancing efficiencies, conducting programs and conservation.

Scope and Goals of Green Auditing

A clean and healthy environment aids in effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Green Audit is an efficient and ecological way to manage environmental problems.

The audit scope covers **Water** (consumption, conservation & disposal), **Solid waste** (generation, segregation and disposal), **Carbon foot print** and steps to reduce, **Energy** (consumption, generation & conservation) and **Green campus** (greenery, techniques & bio diversity)

It is necessary to conduct green audit in college campuses in order to make the management aware of its current status with respect to the environmental aspects as well as update on the latest developments and requirements in terms of environmental compliances and best practices. Apart from this, the involvement of students in the environmental activities and programs of the college along with the audit, aids in shaping them into responsible citizens of the world.



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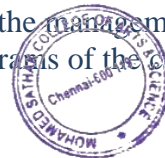
Objectives of Green Audit

The main objective of Green audit is to assess the environmental quality and the management strategies being implemented. The specific objectives are:

- ✓ To assess the quantity and quality of the water consumed in the college campus
- ✓ To check the measures taken for water conservation
- ✓ To monitor the energy consumption pattern of the college & steps taken for Energy conservation
- ✓ To quantify the liquid and solid waste generation and management plans in the campus
- ✓ To study the implementation of source segregation of waste generated and disposal methods
- ✓ To assess the carbon foot print of the college
- ✓ To assess the measures implemented to reduce Carbon Footprint
- ✓ To survey and verify the campus greenery and gardening techniques
- ✓ To identify the gaps and suggest recommendations to improve all aspects

Benefits of Green Audit

- Empower the organizations to frame a better environmental performance
- More efficient resource management
- To provide basis for improved sustainability
- To enable waste management through reduction of waste generation, solid- waste and water recycling
- To create plastic free campus and evolve health consciousness among the stakeholders
- Recognize the cost saving methods through waste minimizing & managing
- Enhance the alertness for environmental guidelines and duties
- Impart environmental education through systematic environmental management approach and improving environmental standards
- Financial savings through a reduction in resource use
- To create a green campus & Enhancement of college profile
- Developing an environmental ethic and value systems in youngsters
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college




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Target Areas of Audit

- Environment Auditing - Water Management, Solid waste Management and Carbon Foot Print
- Energy Management Auditing – Energy (Electricity, Diesel Generator, Solar Power plant and Other Energy equipment)
- Green Campus Auditing - Green Campus (Green cover, Bio-Diversity)

Methodology of Green Audit

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Environment Policy adopted by the institution. The criteria, methods and recommendations used in the audit were based on the identified risks.

The methodology includes: preparation and filling up of questionnaire, physical inspection of the campus, observation and review of the documents, interviewing responsible persons and data analysis, measurements and recommendations. The methodology adopted for this audit was a three step process comprising of:

Data Collection

In data collection phase, exhaustive data collection was performed using different tools such as observation, survey, communicating with responsible persons and measurements. Data collection was done from the primary sources (see Questionnaire in Annexure A)

Following steps were taken for data collection:

The team visited each Block, Department, Library, Canteen, Gardens, and Campus etc. Data on the general information was collected by questionnaire, observation and interview.

- Water usage and conservation data
- Energy consumption meter readings, connected loads
- Identification of Plants and listing
- Waste generated and segregation at source measurement methods and disposal




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Surveys were conducted

- ✓ To assess the carbon foot print due to travel by students and staff
- ✓ To assess the environment awareness levels among the students and staff (online quiz)

Data Analysis

Detailed analysis of data collected included:

Water usage, quality & treatment; Quantities of solid waste& disposal; computation of energy consumption, analysis of latest electricity bill of the campus, utilization of Solar power generated; Carbon emissions due to vehicular pollution, diesel generator, LPG and any other sources

Recommendation

On the basis of results of data analysis and observations, recommendations have been provided against each section on

- water conservation & treatment
- energy conservation & optimum utilization
- e-waste disposal
- bio-diversity



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Chapter III

Audit Stage - Planning

In MSCAS green auditing was done with the collaboration of Trusted SCM and IQAC coordinator. A training program was organized by Trusted SCM to orient the staff on various aspects of green auditing. The green audit began with the teams walking around examining all the different facilities of the college, identifying the different types of appliances and utilities (lights, taps, toilets, fridges, etc.), as well as measuring the usage per item (Watts indicated on the appliance & ISEER star rating) and identifying the relevant consumption patterns (such as how often an appliance is used) and their impacts. The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Solid Waste, Greening, Carbon footprint and Water.

Comments on Site Tour

Site inspection was done along with green audit coordinator. Audit team visited laboratories, libraries, class rooms, garden, college campus, solar power generation fields, play grounds etc. Questionnaires were answered during the site tour. They have shared their expectations about a green campus and gave suggestions for the audit recommendations. Data collected in different intervals were consolidated later.

Review of Documents and Records

Data verification was done with office records. Documents such as electricity bills, Annual report of the college, UGC report, Citizen Consumer Club records etc. were also verified as part of data collection.



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Review of Policies

Discussions were made with the college management regarding their policies on environmental management. The management would formulate a revised environment /green policy for the college in the light of green auditing. The purpose of the green audit was to ensure that the practices followed in the campus are to be in accordance with the green Policy adopted by the institution.

Interviews

In order to collect information for green auditing different audit groups interviewed office staff, Principal, teaching and non-teaching staff and students of the college. Discussions were held to clarify doubts regarding certain aspects.

Site inspection

College and its premises were visited and analyzed by the audit-team several times to gather information. Campus trees were counted and identified. Playgrounds, canteen, pantry, library, office rooms, class rooms and vehicle parking areas were also visited to collect data. The team also visited washrooms with specific permission; terrace to check water tanks, solar power plant, roof top garden and RO plant; open grounds for rain water harvesting, bore wells, sump, solid waste storage area and disposal methods.



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ENVIRONMENT AUDIT REPORT

2023-24

<i>I</i>	<i>WATER MANAGEMENT</i>
<i>II</i>	<i>SOLID WASTE MANAGEMENT</i>
<i>III</i>	<i>CARBON FOOT PRINT</i>

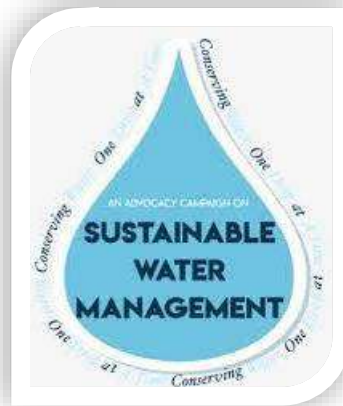


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I. WATER MANAGEMENT AUDIT REPORT

2023-24



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I. Water Management

Need

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 the 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 the sample sources of water continuously. Hence, the national mission on water conservation was declared by the then Hon. Prime Minister 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. A water audit is an onsite survey & assessment to determine and improve efficiency of water use.

Audit Parameters

Following are the key parameters used in water management audit:

1. Sources of water
2. Quality of water
3. Measurement & Consumption
4. Waste water disposal
5. Awareness and communication
6. Best Practices
7. Suggestions/ Recommendations



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Observation and Inferences

1. Measurement (Source, Storage & Usage)

Source of Water: Well & Borewell

Source	Nos	Measurement
a) Open well	4	175 Feet
b) Bore well	4	320 Feet
Storage		
a) Water sump (1)	3	36000 Litters
b) Water sump (2)	2	12000 Litters
c) Overhead tank	6	25000 Litters
Usage / Day		25000 Litters

The utilities for water are 2 Hostels, Mess, Canteen, Gardening and RO plant. The Mess & canteen are located inside the college campus.

2. Water Quality

- Please see water quality test report - Annexure

a) Testing of water sources:

- The water from the open well and bore well sources is pumped and stored in overhead tanks before being fed to the utilities.
- The TDS of this water is tested periodically at the RO plant and is found suitable for usage.
- It is being used as it is for all general purposes like washrooms, canteen and labs for cleaning purposes

b) Purification methods

- There is a well maintained 2 nos of RO plant of 2000 & 1000 liters capacity RO




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water is used for drinking purposes.

- The reject water from the RO plant is collected separately and used for watering the garden
- RO Water quality has been tested in a laboratory and test reports are attached.
- The test report shows that all parameters are well within the permissible limits

3. Measurement and Consumption

Water Consumption pattern	In liters
1.Hostel (students / liters)	3,500
2.Laboratory	4,000
3.Mess, Canteen (Cooking & Washing)	6,000
4.Gardening	5,000
4.Day's scholars (utilities & drinking)	6,500
Total usage / day	25,000

Water consumption per-capita ~liters per day

4. Water Conservation

Sl #	Desired conservation methods	Observation
1	Rain water Harvesting (RWH)	Implemented
2	Water level indicators/ controllers	Yet to be done
3	Water Flow meters	Yet to be done
4	Re-cycling of waste water (Sewage plant)	In-progress (plan to complete by end Sep'24)
5	No leaky taps/ pipes/ joints	Water taps & pipes are well maintained
6	Automatic taps & urinals	Yet to be done (partially implemented)
7	Drip irrigation	Yet to be done
8	Re-use of RO reject water	Implemented



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5.

Waste water disposal

For recycling of waste water, Sewage Treatment Plant (STP) is under progress.

1. Awareness and Communication

Trusted SCM conducted a quiz on all topics to the students and staff of MSCAS. The summary of the quiz is in the Annexure 1. Two questions in the quiz were pertaining to Water conservation. Only 59% of the answers were correct

2. Best Practices

- Rain Water Harvesting(RWH) properly implemented
- Sewage Treatment Plant (STP) is in place, however it is not functional
- Sensor based water flow control system implemented in 2 over head tanks
- Water conservation awareness slogans are displayed at water outlets to save water

3. Suggestions & Recommendations

- Water consumption to be measured using flow meters. Measurement will help in looking at ways to reduce usage
- To avoid overflowing / wastages from Over Head Tanks, sensor system to be installed
- STP unit to be repaired and restored on priority. Being voluminous college STP plays vital role in water conservation
- Main block, Rain water harvesting (RWH) outlets to be connected to the nearby well



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II. SOLID WASTE MANAGEMENT AUDIT REPORT

2023-24



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Solid Waste Management

Need

Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. Solid waste management reduces or eliminates the adverse impact on the environment and human health. A number of processes are involved in efficiently managing waste for an organization. It is necessary to manage the solid waste properly to reduce the load on waste management system.

The solid waste audit focused on volume, type and current management practice of solid waste generated in MSCAS campus. The solid waste collected was paper waste, plastic, bio-degradable waste, construction waste, glass waste, electronic (e-waste) and other miscellaneous waste. Solid waste disposal management audit is an on-site survey & assessment to determine and improve efficiency and effective waste disposal system.

Audit Parameters

Following are the key parameters used in waste management audit:

1. Sources of waste generation
2. Types / volume of waste generated
3. Segregation of waste
4. Disposal Mechanism
5. Best Practices
6. Awareness and communication
7. Suggestions/ Recommendations



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Observation and Inferences

1. Sources of waste generation

SI #	Source	Types of Waste
1	Students	Paper, Pen, Refill, Plastic water bottles, food waste, paper plates. other plastic materials, washings, Urinals and Electronic parts, Paper plates, Food wastes, sanitary napkins
2	Administration (Staff and Teachers)	Paper, Pen, Refill, Plastic & other plastic materials, Washings, Urinals, broken furniture & glass , E-waste
3	Natural accumulation (Garden, Playground & parking area)	Dry leaves, Paper waste, Paper plates, Food wastes
4	Others (Visitors and construction)	Paper, plastic and construction material wastes

Approximate quantity of waste generated per day (in kg)			
	Biodegradable	Non- biodegradable	Hazardous / others
o Office	5kg	Nil	Nil
o Laboratories	2 kg	Nil	Nil
o Canteen / Kitchen	25kg	1kg	Nil

2. Waste Type & Volume

#	Category	Types of Waste	Approx. Qty generated -Annually
1	E-Waste	Computer / Computer parts, Electrical / Electronic appliances	Re-cycled*
2	Dry Waste	Plant / Tree Leaves	
3	Solid Waste	Damaged furniture/glass, pen, paper, cardboard, metal	5 Kg
4	Wet Waste	Food waste (canteen/mess)	10 Kg
5	Hazardous Waste	Chemicals used in laboratories	
6	Bio-medical waste	Sanitary Napkins	



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- **Segregation of waste**

- Bins kept at few places for collection & segregation : Bio-degradable, Plastics, E-waste and Bio-medical waste
- The segregated dry waste is accumulated and handed over to an agency (with whom MSCAS has an MOU) for safe and proper disposal)
- Wet waste is handed over to the municipal body for taking to the compost yard for converting into compost
- *E-waste, is consolidated at their head office & most of the items are re-furbished

- **Best Practices**

- College has banned single-use plastics/ polythene covers in the campus
- E-waste disposal – all the e-waste from the group institution are consolidated at their head office and most of the parts are re-furbished and used
- Disposal Process of Laboratory Hazardous chemicals (document enclosed)

- **Awareness & Communication**

Trusted SCM conducted a quiz on all topics to the students and staff of MSCAS. The summary of the quiz is in the Annexure 1. Two questions in the quiz were pertaining to Solid waste management. 78% of the answers were correct

Suggestions & Recommendations

- Colored bins with labeling for proper segregation of different types of waste are kept at every floor of the campus
- Reduce use of virgin paper & switch to recycled paper. As a further step move all transactions and communication within the college to electronic mode
- College to measure the amount of solid waste generated. Only then they can take steps to reduce waste generation
- More awareness programmes to be imitated for students and teaching staffs





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Best Practice Disposal Process of Laboratory Hazardous chemicals

Biological waste includes

- liquids such as used cell culturing media, supernatant, blood serum, etc., which contain viable biological agents;
- materials considered pathological, petri plates and test tubes with Bacterial and fungal culture
- solid laboratory waste (empty plastic cell culture flasks and petri dishes, empty plastic tubes, gloves, wrappers, absorbent tissues, etc.) contaminated with viable biological agents;
- Laboratory glassware which is suspected to be contaminated with hazardous biological agents.

Disposal of wastes after treatment

Sterilization and Disinfection

For safety reasons the biological agents, inactivated by employing either chemical disinfection or steam sterilization procedures

- Autoclaving (steam sterilization) is the preferred and most reliable) method of sterilizing biological waste. Depending on the volume of waste to be sterilized, it may be necessary to extend the duration of exposure to high temperature steam under pressure.

Liquids containing Bio-Hazardous Agents

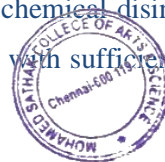
- Liquid waste containers withstanding autoclaving temperatures are used during steam sterilization

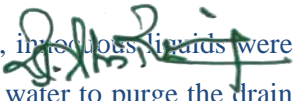
Solids Containing Bio-Hazardous Agents

Solid laboratory waste like empty plastic cell culture flasks and petri dishes, agar plates, empty plastic tubes, gloves, wrappers, absorbent tissues, large volumes of **agar gel** in disposable petri dishes and tubes etc. known to be, contaminated with viable biological agents were placed in Autoclavable plastic disposable bags and sterilized. These bags of solid waste were closed but not sealed airtight to allow steam penetration before they are placed into the autoclave chamber.

Disposal

Following (picture demonstrated) steam sterilization or chemical disinfection, infectious liquids were disposed of via the laboratory drainage system. Flushed with sufficient clean water to purge the drain immediately after disposal of all liquids.




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III CARBON FOOT PRINT AUDIT REPORT

2023-24



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Carbon Foot Print Management

Need

The most common greenhouse gases are carbon dioxide, water vapor, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the earth's atmosphere through human activities is commonly known as carbon emissions. The question is what should be done to reduce carbon emissions. Often the challenge lies in choosing just the right approach that will contribute most to the objective. Naturally, the results of these interventions also have to be monitored and assessed. Many colleges want to reduce their carbon dioxide (CO₂) emissions. But that's not so easy, given that a range of factors determine carbon emissions, including mobility, waste, and energy consumption. So, gaining insight into CO₂ emissions is extremely important.

An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact. ***We can determine what our carbon footprint is, based on the amount of carbon emissions created by fossil fuels.*** One aspect is to consider the distance and method traveled between home and college every day. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards sustainable development. As per latest estimates the average carbon emissions per capita in India is 1.9 MT / capita out of this transportation accounts for approximately 15%.

In the case of Educational Institutions, the major sources of carbon emission are diesel generator, cooking gas and vehicles. While vehicles are not driven much within the campus, the total emissions due to travel by students and staff from their home to the campus is an important parameter to be measured.



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Audit Parameters

Following are the key parameters used in carbon emissions audit:

1. Sources, Measurement of Carbon foot print
2. Awareness and communication
3. Best Practices
4. Suggestions and Recommendations

Observations and Inferences

1. Measuring Carbon Foot print

- Diesel generator: There are 3 DG sets in the campus of capacities 250 KVA, 125 KVA & 100 KVA. Average consumption of 100ltrs of diesel every month.
- Cooking Gas: 20 no's of Commercial LPG cylinders of 19 kg are used in the hostel kitchen, canteen and laboratories. Out of this only 12 cylinders are refilled each year.
- Fire wood: Fire wood is used as an alternate fuel. Mostly waste wood from fallen branches in the college is being used. In addition the college purchases 500 kg fire wood per month
- Vehicular Emissions: Parking is available for 20 bicycles, 40 bikes and 10 cars in the campus. The college runs 10 buses across Chennai city. A survey on travel to college pattern was taken in which 254 students participated. This was to identify their mode of transport and the distance travelled. This has been extrapolated to 794 no's (strength of students & staffs). The following tables reflect the data:




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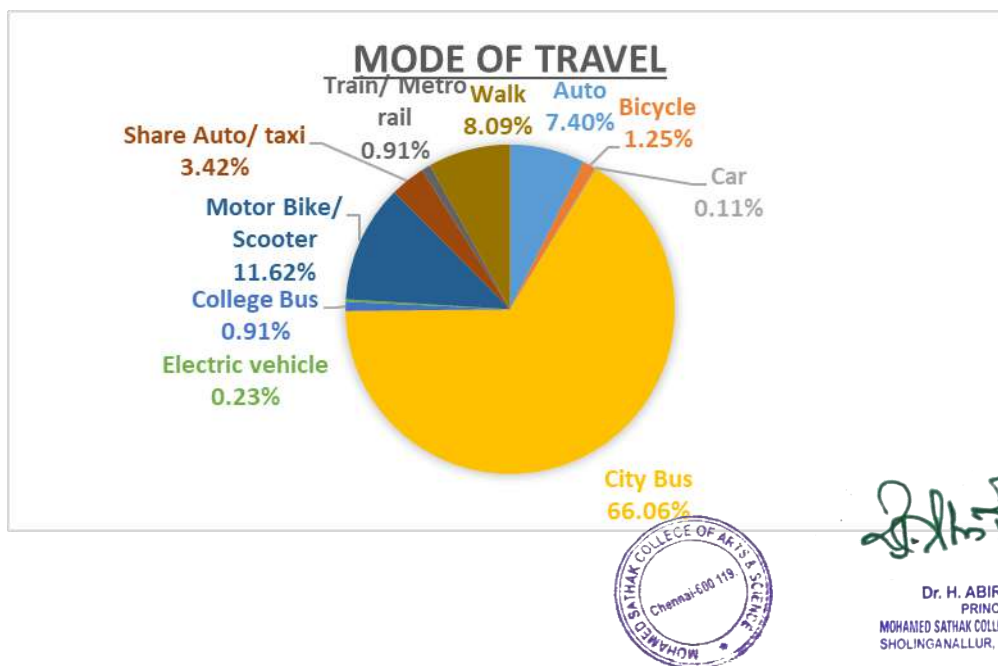
Travel related carbon emissions

a) Mode of travel

Distance travelled by students in different modes

Mode of Travel	Students	Two way distance per day (kms)	Average distance per day	Extrapolated Student count	Distance travelled in a year (180 days)
Auto	65	1,000	15	252	6,97,793
Bicycle	11	250	23	43	1,74,413
Car	1	64	64	4	44,650
City Bus	580	20,518	35	2,248	1,43,14,599
College Bus	8	252	31	31	1,75,669
Electric vehicle	2	80	40	8	55,812
Motor Bike/ Scooter	102	3,336	33	395	23,27,373
Share Auto/ taxi	30	444	15	116	3,09,758
Train/ Metro rail	8	674	84	31	4,70,219
Walk	71	166	2	275	1,15,811
Total as per survey	878	26,784	31	3,403	1,86,86,098

** actual data received from 878 students. Extrapolated to total population



Carbon emissions calculations

Mode of transport	Distance per yr	Fuel used	Kms per ltr	Ltrs per yr	No: of persons per vehicle	ltrs per yr per person	CO2 emission in kg per ltr	CO2 kg per yr
Auto	6,97,793	petrol	30	23,260	1	23,260	2	55,591
Bicycle	1,74,413	na	-	-	-	-	-	-
Car	44,650	petrol	12	3,721	2	1,860	2	4,446
City Bus	1,43,14,599	diesel	4	35,78,650	50	71,573	3	1,88,953
College Bus	1,75,669	diesel	4	43,917	40	1,098	3	2,899
Electric vehicle	55,812	na						
Motor Bike/ Scooter	23,27,373	petrol	50	46,547	2	23,274	2	55,624
Share Auto	3,09,758	diesel	30	10,325	3	3,442	3	9,086
Train/ Metro rail	4,70,219	na						
Walk	1,15,811	na	-	-	-	-	-	-
Grand Total	1,86,86,098							3,16,599

Tonnes per annum 316.60
Kgs per person per annum 93.04

Summary

1. 316 tonnes of Carbon dioxide emissions per year due to travel to the college by students/ staff
2. This amounts to 93 kgs per person per year
3. 10.5% of students+staff are in the "Zero emission" category
4. 73% use public transport or walk/ bicycle
5. CO2 emissions per person per year (kgs)

Travel	93.04
Diesel Generator	0.60
LPG	0.10

93.74




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2. Awareness & Communication

- Trusted SCM conducted a quiz on all topics to the students and staff of MSCAS. The summary of the quiz is in the Annexure 1. Two questions in the quiz were pertaining to carbon emissions. Only 70 % of the answers were correct

3. Best Practices

- ✓ Usage of bicycles inside the campus is encouraged
- ✓ Pedestrian friendly pathways in the college

4. Suggestions / Recommendations

- The college can put up a display board on all the initiatives related to environment including fuel emissions
- Metro rail which is expected up to the college in the next 2 years, is likely to reduce the carbon foot print to a large extent



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ENERGY AUDIT REPORT

2023-24



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Need

As per the Energy Conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption".

Electricity is the main source of energy to run an educational institution like MSCAS. It takes care of all requirements like lighting, fans, ACs, water motors, RO plants etc.

The scope of audit covers the entire electrical energy requirements of the college, the sources, measurement, consumption, conservation techniques, use of renewable energy and awareness among staff and students. The scope also includes cost benefit analysis of projects done, identification of areas for improvement and recommendations to move towards higher energy efficiency.

The main goals of energy audit are:

- Reducing energy consumption in a systematic manner by:
 - o Constant monitoring and measurement
 - o Identifying leakages / wastages
 - o Alternate energy efficient methods / products
 - o Creating awareness
- Becoming self-sufficient in energy generation through sustainable methods like renewable energy
- Saving environment through efficient energy usage as well as saving energy costs for the institution



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Audit Parameters

Following are the key parameters used in Energy audit:

1. Energy sources
2. Measurement and Consumption
3. Awareness and communication
4. Best Practices
5. Suggestions/ Recommendations

Observation and Inferences

(i) Management Commitment

The Management of the college has shown the commitment towards Energy audit during the pre-audit meeting. The management was willing to formulate policies and take actions based on energy audit report. Two major actions taken to reduce energy consumption based on recommendations during previous audit cycle during 2020-21:

1	All tube lights replaced with LED lights reducing energy consumption by half
2	Roof top On-grid Solar plant of 50KW capacity installed. Another 115KW planned to be installed in next three months




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Analysis of Electrical Load

Connected load & Consumption Estimates

A. Connected Load							
Loads	Wattage for one no.	Building/ Dept/ Block name/ number			Connected load KW	Average usage in Hrs / day	Consumption estimate KWH per/day
		A	B	Total nos			
FANS	80	600	600	1200	96	4	384
Tube Lights	40	30	20	50	2	8	16
CFL Tubes	15	15	10	25	0.375	2	0.75
LED Bulbs	18	30	40	70	1.26	2	2.52
LED Tubes	20	700	800	1500	30	2	60
Standalone AC	1500	10	57	67	100.5	3	301.5
Projectors	40	15	9	24	0.96	3	2.88
Computers/Laptops	200	350	200	550	110	5	550
Printers/Photocopiers	30	20	14	34	1.02	1	1.02
Television	100	1	1	2	0.2	10	2
Motor	200	2	2	4	0.8	2	1.6
Total					343.115		1322.27

Connected load reduced by 30 KW, by replacing tube lights with LED tubes & bulbs

EB Consumption Summary for One Year (Aug'23 to Jul'24)

Consumer No	Meter No	Load in KW	Units Consumed	Current Consumption Charges	Rate per Unit	Other charges	Other charges per KW	Total Charges
9327002343	8427277	50	81,080	7,43,628	9.17	1,47,693	246.16	8,91,321
9327002344	12327739	110	57,968	4,91,668	8.48	5,52,473	418.54	10,44,141
9327002345	922000	108	39,987	3,65,770	9.15	5,33,088	411.33	8,98,858
93270021103	8727954	95	85,314	7,83,028	9.18	4,28,817	376.16	12,11,845
93270022727	499044	74	42,563	5,24,042	12.31	5,37,037	604.77	10,61,079
Totals		437	3,06,912	29,08,136	9.48	21,99,108	419.36	51,07,244

Check with TNEB on the other charges break-up

Load adjustment can be done between meter connections for efficient load utilisation




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b) Alternate sources of Electricity

1. Diesel Generator

- There are 2 diesel generators of 250 KVA, 62.5 KVA capacities to support the energy needs of the college and hostel during power shutdowns
- The DGs are well maintained for efficient running

2. Solar power plant

- a. A 50 KW On-grid Roof top Solar power plant with Net metering is being installed. To be commissioned in September'24

On a conservative estimate, considering an average of 5.5 hrs of good sunlight in Chennai throughout the year other than the rainy days, which could be considered as 50 days:

Units generated by the Solar plant per day = 50KW x 5.5 Hrs = 275 KWH per day

No: of sunny days per annum = 315

Total Units generated per annum = 275 units x 315 days = 86615 Units

Ie., 7200 units per month

EB Cost per unit = Rs.9.00

Estimated Savings = Rs.7.8 lacs per year

- b. Another 115 KW Solar plant is planned to be installed in 3 months' time

Units generated = 115 x 5.5 = 632.5 kwh per day

Units generated per annum = 199237 units

At full efficiency, both Solar plants put together should take care of 90% of Institution's electricity requirement.



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(ii) **Awareness among students and staff**

- Trusted SCM conducted a quiz on all topics to the students and staff of MSCAS. The summary of the quiz is in the Annexure 1. Two questions in the quiz were pertaining to Energy management. 74% of the answers were correct.

iv. Suggestion & Recommendations:

Given during 2021-22

- *EB consumption to be monitored every month, steps to be taken to reduce consumption*
- *Tube lights to be replaced with LED lights in a phased manner*
- *One EB has high fixed charges to be analyzed and corrected*
- *Roof top solar power plant will help in reducing EB power and also help in environmental protection (by reduction in fossil fuel)*
- *5kva grid based solar plant would cost around 3 lakhs, the savings would be 10,000 unit/year, which is equal to Rs.75,000/year, with a payback period of 4 years.*

All the above suggestions have been implemented by the Institution. These actions are commendable and well appreciated.

Recommendations for 2023-24

- All fans in a room are being operated through a single switch. Separate switch for each fan recommended. This will ensure only fans that are required are switched ON.
- Any new fans or replacement fans can be BLDC fans which consume half the power
- Awareness programs for students to be continued




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GREEN CAMPUS AUDIT REPORT

2023-24



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Green Campus

Need

Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen released by the trees of the campus is good for the people in the campus. So while you are busy studying and working on earning those good grades, all the trees in campus are also working hard to make the air cleaner for you.

Green Campus is an environment which improves energy efficiency, conserving resources and enhancing environmental quality by educating for sustainability and creating healthy living and learning environments. Green Campus rewards long term commitment to continuous environmental improvement from the campus community.

Audit Parameters

Following are the key parameters used in Green campus:

1. Green cover
2. Identification and classification of vegetation
3. Best Practices
4. Awareness and communication
5. Suggestions and Recommendations



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Observation and Inferences

- Total area of campus: ----- acres
- Green Cover with trees, flowering plants area: __ sq.ft. (tree canopy)
- Bio-diversity greenery with 20% is covered with trees, herbs & approx.
- Availability of a variety of vegetation including a few large trees has encouraged birds, insects and small animals like squirrels to find refuge in the campus
- Botanical garden work is under progress
- In-house composite manure system in place for garden purpose
- Full-time gardeners are engaged in maintenance of garden
- Regular Green Environment awareness programs are conducted

Awareness and communication

- Displayed plants common name and botanical name
- Trusted SCM conducted a quiz on all topics to the students and staff of MSCAS. The summary of the quiz is in the Annexure 1. Two questions in the quiz were pertaining to Greenery and bio-diversity. 79% of the answers were correct

Best Practices

- Excellent & well maintained Garden with varieties of trees and plants
- Manure obtained from compost yard which is in turn fed by the organic waste



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Suggestions & Recommendations

- Conduct competitions among departments for making students more interested in making the Campus green
- A separate herbal garden or vegetable garden can be developed with student participation.

Bio diversity

- ✓ Due to the large volume of greenery in the campus, it attracts birds and other species.
- ✓ It is recommended that the institution identify the flora / fauna and record it.
- ✓ A photography contest may be conducted among the students for capture different species.



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List of Trees with Botanical and Tamil Name

SI No	Common name	Scientific name	Category	No of trees / plants	Tamil Name
1	Neem	Azadirachta indica	Tree	6	Veepamaram
2	Coconut Tree	Cocos nucifera	Tree	5	Thennai
3	Bamboo	Bamboosa aridinarifolia	Grass	5	moongil
4	Cannonball Tree	Couroupita guianensis	Tree	3	Naagalinga maram
5	Cotton	Gossypium herbaceum	Tree	3	paruthi
6	Butterfly tree	Bauhinia tomentosa	Tree	3	Mandarai yellow
7	Peepal Tree	Ficus religiosa Linn.	Tree	3	Arasa
8	Pongam Tree	Millettia pinnata	Tree	3	Pungai maram
9	Banana	Musa paradiscum	Fruit Tree	3	vaazhai
10	FIG Tree	Ficus benjamina	Fruit Tree	3	Athi maram
11	Tulsi / Holy Basil	Ocimum tenuiflorum	Herbs	3	Thulasi
12	Hibiscus	Hibiscus rosa-sinensis	Ornamental Plant	3	Sembaruthi
13	TIGER TOOTH ALOE	Aloe juvenna	Ornamental Plant	3	
14	Nitya Kalyani	Catharanthus roseus	Ornamental Plant	3	Nitya malli
15	ASHOKA Tree	Polyalthia longifolia	Tree	2	Asoka
16	Alexander laurel	Calophyllum inophyllum	Tree	2	Punnai
17	Bullet wood	Mimusops elengi	Tree	2	magizham
18	Mango	Mangifera indica	Fruit Tree	2	Maa
19	Naval Tree	Syzygium cumini	Fruit Tree	2	Naval
20	Henna (Mehndi)	Lawsonia inermis	Herbs	2	Marudhani
21	Banyan	Ficus benghalensis	Tree	1	Aala
22	Drumstick	Moringa oleifera	Tree	1	Murungai
23	Manoranjani/ Harichampa	Artabotrys hexapetalus	Tree	1	Manoranjitham
24	Palm Tree	Arecaceae	Tree	1	panai
25	ROYAL PALM	Roystonea regia	Tree	1	Arasa panai
26	Champak/ Shenbagam	Magnolia Champaka	Tree	1	Shenbaga poo
27	Tree Jasmine	Millingtonia hortensis	Tree	1	Maramalli
28	Vilvam Tree (Bilva)	Aegle marmelos	Tree	1	Vilva maram
29	Wood apple	Limonia acidissima	Fruit Tree	1	Vilam pazham
30	Sapota Tree	Manilkara zapota	Fruit Tree	1	Sappota
31	Guava	Psidium guava	Fruit tree	1	Goyya
32	Papaya	Carica papaya	Fruit tree	1	pappali
33	Money Plant	Epipremnum aureum	Ornamental Plant	1	
34	Golden trumpet	Allamanda cathartica	Ornamental Plant	1	
35	Rose	Rosa	Ornamental Plant	1	Roja
36	Bougainvillea	Bougainvillea glabra	Ornamental Plant	1	
37	SNAKE PLANT	Sansevieria roxburghiana	Ornamental Plant	1	
38	Coral Jasmine	Nyctanthes arbor-tristis	Ornamental Plant	1	



[Handwritten Signature]
K. S. S. S. S.

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KOLLAM, KERALA

ANNEXURE - A

Environmental Quiz Summary & Data Collection Questionnaire

16-Aug-24

Environment Awareness Quiz

Md Sathak College of Arts and Science

TrustedSCM conducted an online quiz (MCQ) to evaluate the awareness levels of students and staff of the college. The results are given below

Participant Info

		10/10	9/10
No: of participants	505	155	67
Students	505	155	67
Staff	0	0	0
Participants scoring 10/10	155	31%	
Participants scoring 9/10	67	13%	
Average score	7.21		



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Quiz questions and correct responses

Q no.	Quiz Question	Topic	No: of correct answers	% correct
1	Which gas is the highest among fossil fuel emissions?	Carbon footprint	337	67%
2	Which of these is not a fossil fuel?	Carbon footprint	372	74%
3	Which of the following sources of light consumes least energy?	Energy	383	76%
4	Photo-voltaic or PV technology is used to convert which energy into Electrical energy?	Energy	369	73%
5	Which of the following items should NOT be added in composting?	Solid Waste	393	78%
6	Discarded Computer and Mobile phone parts are considered as which category of waste?	Solid Waste	399	79%
7	Which is NOT a method of conserving water?	Water	298	59%
8	When we let out sewage or chemical effluents into a water body (lake, river etc) without treatment, the following does NOT happen:	Water	295	58%
9	Biodiversity is the availability of large variety of plant and animal species. It is found most in...	Green	384	76%
10	Trees provide shade and shelter to birds, insects, squirrels.. they purify the air by absorbing Carbon dioxide and emitting which gas?	Green	413	82%




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Topic category wise correct responses

Environmental Audit

1	Water Conservation	593	1010	59%
2	Solid Waste Management	792	1010	78%
3	Carbon emissions	709	1010	70%
	Total	2094	3030	69%

Energy Audit

1	Energy Conservation	752	1010	74%
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Green Audit

1	Green cover and bio-diversity	797	1010	79%
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Students to be taken through regular awareness sessions and communication on environment through posters, notices, placards etc. The minimum score should be aimed at 85%




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Data Collection Questionnaire

I. Water Management

S#	<i>Questioners</i>	<i>Response</i>
1	What are the sources of water	
2	How many bore-wells? And depth of bore-wells : Nos, Depth(in feet)	
3	Water sump capacity in Liters	
4	Overhead water tank capacity (in liters): Nos,	
5	Quantity of water used per day (in liters)	
6	Are water flow meter installed?	
7	Approx. break-up of water usage	
8	Is RO Plant available? What is the capacity? How much RO water is produced / day	
9	Water usage for Gardening? Which water? How is the watering done? Approx. Qty	
10	Steps taken to conserve water / save water	
11	Is rain water harvesting done? How many pits done across the campus?	
12	Any leaky? Amount of water lost per day?	
13	Amount of water lost / day	
14	Waste water sources	
15	Any use of waste water	
16	Any waste water / effluent from labs? Where is this water let out? Is it treated before letting into ground / drain?	
17	Is quality of treated water tested periodically?	
18	Whether any green chemistry methods are practiced in your labs?	
19	Is there a sewage treatment plant installed? What is the capacity?	
20	If not, how is the sewage water disposed? From clarified water from septic tank is disposed outside of the campus	




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II. Solid Waste Management

<i>How the waste generated in the College is managed?</i>	<i>Yes / No</i>	<i>Remarks</i>
A) Composting/ Vermicomposting		
B) Recycling		
C) Reusing		
D) Other ways		

Waste Generated in the college:

S.No	<i>Parameters</i>	<i>Response – Disposal method</i>	<i>Remarks</i>
1	E-waste		
2	Hazardous waste		
3	Solid waste		
4	Dry leaves		
5	Canteen waste		
6	Liquid waste		
7	Glass		
8	Unused		
9	Equipment		
10	Napkins		
11	Others (specify)		
Do you use re-cycled paper in college		-	
Any waste management methods used		-	

Different types of Waste generated and Disposal methods:

S.No	<i>Types of Waste</i>	<i>Particulars</i>
1	E-Waste	Computers, Electrical and Electronics parts
2	Plastic waste	Pen, Refill, Plastic water bottles, & other plastic containers
3	Solid Waste	Damaged furniture, Paper waste, Paper plates, Food wastes
4	Chemical Waste	Laboratory wastes
5	Waste Water	Washings, Urinals, Bathrooms
6	Glass Waste	Broken Glass wares from Labs




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(iii) Carbon Foot Print Waste Management

S.No	Questions	Response
1	What is the total strength of students and teachers in your College?	
2	Total Number of vehicles used by the stakeholders of the college. (per day)	
3	No. of cycles used	
4	No. of two wheelers used (average distance travelled and quantity of fuel and amount used per day)	
5	No. of cars used (average distance travelled and quantity of fuel and amount used/ day)	
6	No. persons using common (public) transportation (average distance travelled and quantity of fuel and amount used per day) :	
7	No. of persons using college conveyance by the students, non-teaching staff and teachers (average distance travelled and quantity of fuel and amount used per day)	
8	Number of parent-teacher meetings in a year? Parents turned up (approx.)	
9	Number of visitors with vehicles per day?	
10	Number of generators used per day (hours). Give the amount of fuel used per day	
11	Number of LPG cylinders used in the canteen (Give the amount of fuel used	
12	Quantity of kerosene used in the canteen/labs (Give the amount of fuel used / day and amount spent).	
13	Amount of taxi/auto charges paid and the amount of fuel used per month	
14	Amount of taxi/auto charges paid per month for the transportation of office	
15	Average amount of taxi/auto charges paid per month by the stakeholders of the college	
16	Use of any other fossil fuels in the college (Give the amount of fuel used per day and amount spent)	
17	Suggest the methods to reduce the quantity of use of fuel used by the stakeholders/students/teachers/non-teaching staff of the college.	




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Fossil Fuel Generation:

Source	Fuel	Usage per day	UOM	Average CO2 generated per unit in KGs
✓ Two wheelers	Petrol		Liters	
✓ Four wheelers	Petrol		Liters	
✓ Public transport	Diesel		Liters	
✓ College transport	Diesel		Liters	
✓ Diesel Generator	Diesel		Liters	
✓ LPG cylinders	LPG		Kg	

Total per day

Energy Management

i. Connected Load

Building / Department / Block Nam / No							
Loads	Wattage for one no.	A	B	Total No	Total No of Units	Avg.usage in hrs/day	KWH / Day
Fans							
Tube Lights							
CFL Tubes							
LED Bulb							
LED Tubes							
Central AC							
Standalone AC							
Projectors							
Computers							
Printers							
TVs							
Motor							
Other Equipments							

o KWH Kw / month :

o Energy generation by solar panels : KV Solar cells- kWh/month




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ii) EB Meter Readings:

METER No	Units Consumed	Total Charges	Units Consumed	Units Consumed	Total Charges	Units Consumed	Total Charges

iii) Alternate Source of Electricity

1. Diesel Generator: Qty, Capacity, Average usage / month, connected load, Diesel consumed each year
2. Solar Power Plant / Wind Turbine: Installed capacity, Month wise units generated since installation
3. Steps taken to conserve energy

e. Green Campus

1. Is there a garden in your college? Area?
2. List the plants in the garden, with approx. numbers of each species.
3. Whether you have displayed scientific names of the trees in the campus?
4. How much water is used in the gardens? (Mention the source and quantity of water used).
5. Who is in charge of gardens in your college?
6. Are you using any type of recycled water in your garden?
7. List the name and quantity of pesticides and fertilizers used in your gardens?
8. Do you have any composting pit in your college?
9. If yes what are you doing with the compost generated?
10. Is there any botanical garden in your campus? If yes give the details of campus flora.
11. Give the number and names of the medicinal plants in your college campus.
12. What is the type of vegetation in the surrounding area of the college?
13. What are the nature awareness programmes conducted in the campus? (2020-21)
14. What is the involvement of students in the green cover maintenance?
15. What is the total area of the campus under tree cover? Under tree canopy?
16. Share your IDEAS for further improvement of green cover

17. List of plants in the campus:

S.No	Common / Local name	Botanical Name	Classification	Dr. H. ABIRAM PRINCIPAL




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ANNEXURE - B

PHOTO GALLERY

CAMPUS LAYOUT

Campus Layout @ the entrance of Building



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Tree Planting initiative by college NSS members

Rain water harvesting trenches pipe lines



Rain water harvesting percolation pit



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Energy Management

Electrical Panel



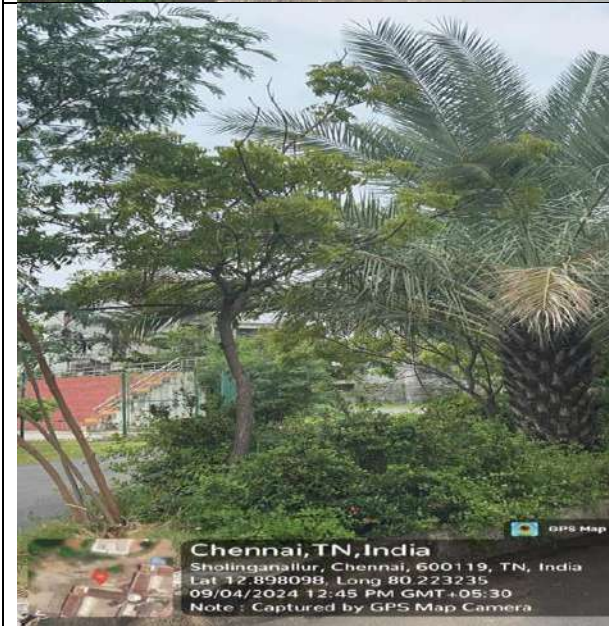
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Solid Waste Management

Loading the Garbage to Chennai Corporation Vehicle



Green Campus



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Audit Completion Certificate

This is to certify that Environment, Energy and Green Audits were conducted for the academic year 2023-2024 at the campus of the **Mohamed Sathak College Of Arts & Science**, 13, Medavakkam Main Rd, Sholinganallur, Chennai, Tamil Nadu 600119 was conducted on 20th August'24. The areas of Audit were Water Management, Solid waste Management, Carbon Foot Print, Energy Management and Green Campus.

The IQAC Coordinator has submitted necessary data and documents for scrutiny. Based on the data provided and observations, it has been found that the college has implemented systems and processes needed to ensure coverage of all areas of audit namely awareness, environment protection, conservation and sustainability..As a part of the audit, we have suggested improvements in the areas mentioned. The details are documented and available in the Audit Report.

Audited by



Srinivasan Ravi Valluri
TrustedSCM Solutions LLP

Date: 20 Aug 2024

Place: Chennai



[Handwritten Signature]

TrustedSCM Solutions

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