



## JSS Academy of Higher Education & Research

(Deemed to be University) (Accredited A+ Grade by NAAC)

### COMPENDIUM ON SDG-13

### CLIMATE ACTION

Compendium of Activities in Achieving UN Sustainable Development Goals



2023-24

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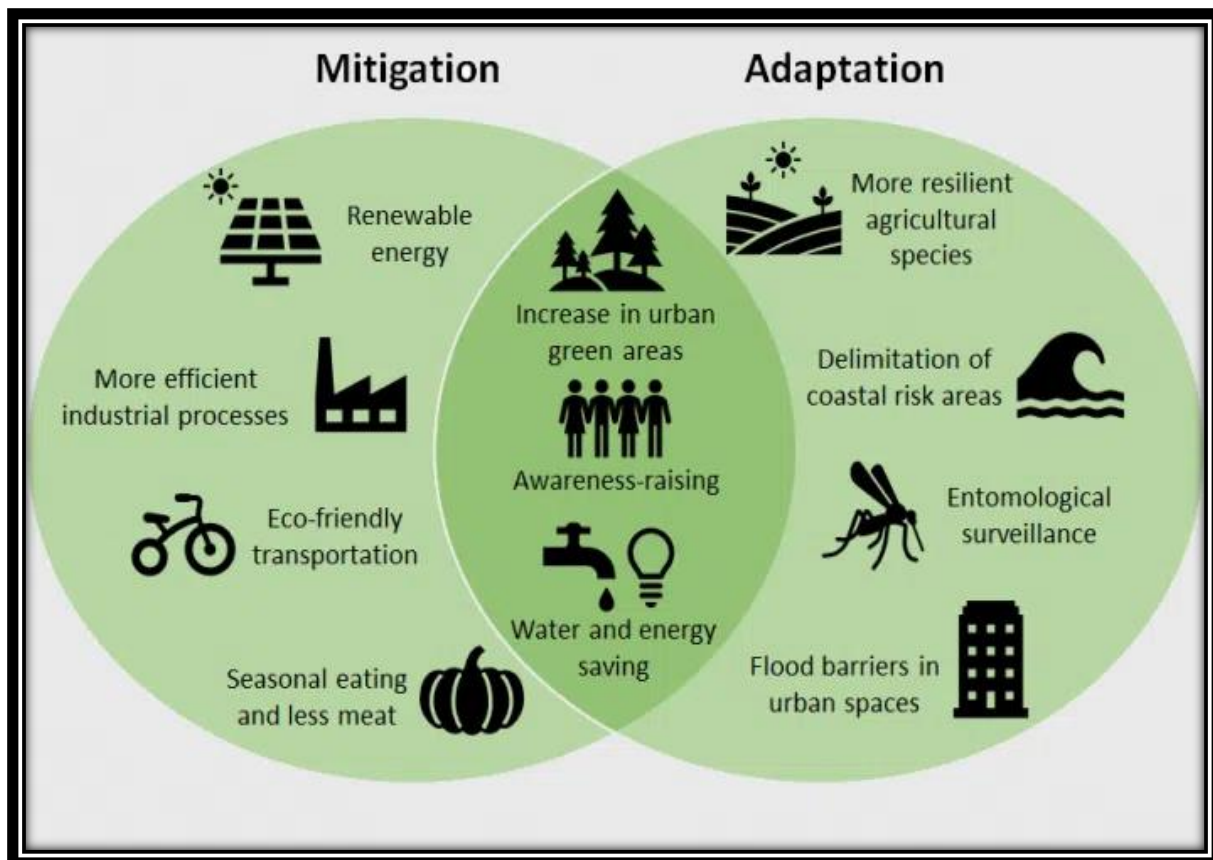
## Introduction:

### Climate change: together we can cool the planet

Climate change continues to pose an escalating global crisis, with significant updates highlighting the urgency of the situation. Record-breaking heatwaves, wildfires, and extreme weather events have intensified, impacting millions worldwide. The Intergovernmental Panel on Climate Change (IPCC) released a stark report, emphasizing that without immediate and drastic reductions in greenhouse gas emissions, global temperatures could exceed the critical threshold of 1.5°C above pre-industrial levels by 2030.

The Arctic experienced unprecedented ice melt, further contributing to rising sea levels and threatening coastal communities. Additionally, deforestation in the Amazon reached alarming rates, reducing its capacity to absorb carbon dioxide and exacerbating climate impacts.

Governments and organizations are increasingly committing to net-zero targets, yet the gap between pledges and actions remains significant. The 2023 United Nations Climate Change Conference (COP28) emphasized the need for accelerated efforts in transitioning to renewable energy, enhancing climate resilience, and ensuring climate justice for vulnerable populations.



[About SDG 13- CLIMATE ACTION](#)

The official mission statement of this goal is to "Take urgent action to combat climate change and its impacts". SDG 13 and SDG 7 on clean energy are closely related and complementary.

According to the UN Policies, SDG 13 has five targets which are to be achieved by 2030. They cover a wide range of issues surrounding climate action. The first three targets are *outcome targets*: Strengthen resilience and adaptive capacity to climate-related disasters; integrate climate change measures into policies and planning; build knowledge and capacity to meet climate change. The remaining two targets are *means of implementation targets*: To implement the UN Framework Convention on Climate Change (UNFCCC), and to promote mechanisms to raise capacity for planning and management. Along with each target, there are indicators that provide a method to review the overall progress of each target. The UNFCCC is the primary international, intergovernmental forum for negotiating the global response to climate change.



## A GLANCE AT EFFORTS



## **BEST PRACTICES**

Green audit assessment team takes this opportunity to appreciate the efforts/initiatives taken by JSS College of Pharmacy, Ooty towards environmental conservation and protection. The college has a thoughtfully crafted Clean and Green Campus policy in place. The college has undertaken many significant initiatives and has reaped successful outcomes as far as water conservation, solid waste management, harnessing of solar energy, maintenance of green cover in campus, and active involvement of the students and staff with the able support by the management in spreading awareness of environmental conservation and the message that it is the prime responsibility of every citizen of our country to safeguard our environment. Documents in support of operation and maintenance of facilities/utilities and the picture gallery of various initiatives can be found in Appendices (Appendix C1 to C7) of this report.

## **CONCLUSION AND RECOMMENDATIONS**

Keeping in view the aims and objectives of green audit in academic institutions, the green audit assessment team conducted the green audit for JSS College of Pharmacy, Ooty, Tamil Nadu, India. The green audit efforts assist the process of identifying the activities taken up by the institute as well as in developing future strategies towards a sustainable environment. The results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage on campus as well as generate action plan for new activities and innovative practices. A few recommendations are proposed to better manage water and waste using eco-friendly and sound scientific techniques. This may lead to the prosperous future in context of Green Campus and thus sustainable environment and community development.

The green audit report is a very powerful and valuable communication tool to use when working with various stakeholders who need to be convinced that things are running smoothly and systems and procedures are coping with natural changes and modifications that occur. Selected photographs of the team visit are presented in Appendix-C7.

**Suggestion for a Wastewater Treatment Plant in campus** - Installing waterless toilets/urinals will certainly reduce the amount of wastewater generated.

At present, the wastewater is let into underground sewage network on the city corporation. The same can be diverted and let into a sewage treatment plant (STP) within the campus and the treated wastewater can be used for secondary purposes such as toilet flushing, gardening/landscaping, vehicle washing, cleaning of common areas, etc. With this, the fresh water used for the above purposes can be saved. Considering the energy and area constraints for erecting the STP, a packaged unit with Sequencing Batch Reactor (SBR) technology followed by tertiary treatment is a good option for the campus.

## **EXIT MEETING**

Site visit by the audit team was concluded by the exit meeting. Discussions were made with Dr. Dhanabal Palanisamy, Principal, Dr. Arun Kanniyappan Parthasarathy, Vice Principal, Dr. Nagarajan J S K, Associate Professor, Shri Basavalingadevaru H K, Administrative Officer and other staff-in-charge regarding their policies and future plans on environmental management. Green audit assessment team members provided some general and some specific feedback based on the observations made during the day. The initiatives already taken by the institution towards various aspects of environmental management was appreciated. Scope for improvement was identified and discussed with the authorities of the institution.

## **GENERAL OVERARCHING RECOMMENDATIONS**

Data inventory is very important for any control and conservation strategies to work. Keeping this in view and the overall context of the organization, the following recommendation are made in addition to the criteria wise recommendations.

- Flow measurement devices can be installed at strategic points (raw water sources – borewells and municipality supply, individual building – academic, administrative and hostels, etc) in the water distribution network to get a proper inventory on the bulk water supplied and actual consumption to identify the consumption patterns, unaccounted for water due to leakages and other losses and device strategies for conservation and control.
- Existing rainwater harvesting system may be strengthened - include entire rooftops and paved areas in the campus. Again, inventory of the amount and usage of rainwater shall help in doing cost-benefit analysis.

- New building construction and renovation of infrastructure shall consider dual plumbing system which can facilitate use of treated wastewater for secondary purposes like toilet flushing. Implement green building concepts for new construction/renovation projects.
- In the context of being medical institutions campus, measures should be explored to use eco-friendly materials as substitutes to non-biodegradable materials, for example, in medical and dental materials and supplies, radiology prints, etc.
- Sensitize the staff and students in terms of overall management of waste including types, generation, collection, transportation, disposal of waste and their harmful impacts on the environment. Also sensitize the staff and students on their roles and responsibilities with respect to 7 R's of sustainability including Rethink, Refuse, Reduce, Repurpose, Reuse, Recycle, Recover.
- Initiate the process and obtain certifications such as ISO 14001 – Environmental Management System (EMS), ISO 50001 – Energy Management System, etc
- Establish an inventory on vehicle usage by students and staff so as to devise strategies for vehicle pooling, promote use of bicycles and other green fuels as much as possible.
- Establish Environment Conservation Committee comprising of both staff (teaching and non-teaching) and students to serve as a body that will hold responsibility for the enactment, enforcement, and review of the Environmental Policy.
- Use eco-friendly and sustainable practices in all events and celebrations, for instance, use steel bottles and steel/glass tumblers in university events like convocation data, orientations days, conferences and workshops, etc.

## **COMMON RECOMMENDATIONS**

- Establish a purchase policy for environmental friendly materials.
- Conduct more seminars and group discussions for students to enhance environmental education.
- Students and staff should be encouraged to identify and address local environmental problems.
- Establish water, waste and energy management systems.
- Celebrate World Environment Day, World Water Day, World Earth Day, Ozone day and others in an effective way.
- Increase the number of display boards highlighting water and energy conservation.

- Faculty members and senior students could educate the fresher's about the location of and how to use all safety and emergency equipment (e.g. eyewash, first-aid kit, fire extinguishers) during orientation/induction program.
- Several nature awareness programs have been conducted. Connecting with nature is key to understand human dependence on nature and the need to preserve that precious resource.
- Fire safety drills should be conducted periodically (in every induction program for the new students) by the authorised fire safety managers. In addition, the faculty members and senior students could educate the fresher's about the location of and how to use all safety and emergency equipment (e.g. eyewash, first-aid kit, fire extinguishers) during orientation/induction program.
- Layout 'Green Chemistry' that reduces or eliminates the use or generation of hazardous substances in the design, manufacture and application of chemical products

#### **4.3 CRITERIA WISE RECOMMENDATIONS**

##### **WATER**

- Ensure two levels (or dual level - A dual-flush toilet is a variation of the flush toilet that uses two buttons or a handle mechanism to flush different amounts of water) of flushing in all the toilets.
- Set up college's own water recycling unit/STP where the recycled water can be used for gardening in college and hostels.
- Take up renovation of traditional and other water bodies/tanks.
- Measure the amount of groundwater drawn from borewells and regularly monitor the water quality.
- Water the garden judiciously.
- Conduct more programs/workshops on water conservation at regular interval and ensure active participation of students and staff.
- Establish Rain water harvesting system

##### **ENERGY MANAGEMENT**

- Conduct more programs on energy conservation at regular interval and ensure active participation of students and staff.
- Replace computers and TVs with LED monitors.

- Observe a power saving day every year.
- Automatic power switch off systems may be introduced.
- Purchase of energy saving equipment with high energy efficiency star ratings.

## **SOLID WASTE**

- Ensure total plastic free practice in campus.
- For the present quantity of food waste generated feasibility of a biogas plant should be worked out.
- Avoid single use plastics for all functions/ events in the institution.
- As per Central Pollution Control Board (CPCB) Implementation Guidelines for E-Waste (Management) Rules, 2011 and 2016, the college coming under educational institution category, has to maintain records on e-waste generated and should be channelized to registered/authorized collection centres/recycler/dismantler. It is recommended that the e-waste generated on campus must be collected and outsourced to the Karnataka State Pollution Control Board (KSPCB) authorised collectors.
- Any hazardous/medical waste generated in campus has to be disposed off as per the Bio-medical Waste Management Rules, 2016 of CPCB. Also, sustain the documentation and maintenance of the inventory of waste, especially bio-medical waste generated and sent to authorized handler should be well.
- A functional compost, vermi compost unit on campus will not only use garden waste/leaf litter but also provide manure inhouse. This will save fertilizer cost.

## **GREEN CAMPUS**

- The motto behind celebrating environment day (such as, World Wetland Day – Feb 2; World Water & Sanitation Day – Mar 22; World Earth Day – Apr 22; World Environment Day – Jun 5; World Water Monitoring Day – Sept 18), must be a routine practice
- Beautify the college building with indoor plants
- Encourage use of drought-resistant vegetation in new or redone landscaping.
- The watering method also influences evaporation rates. Fine sprays and high trajectories result in high levels of evaporation; large droplets and low trajectories minimize evaporation. Sprinklers need to be carefully placed to provide even application rates so

that areas of over watering and under watering are avoided, and to avoid watering paved surfaces.

- Revive activities of nature club / eco club for making campus more green
- Conduct competitions among departments for making students more interested in taking active part and making the campus green
- Undertake more events to spread awareness of cleanliness and nature conservation in schools nearby as part of the institutional social responsibility
- Conduct awareness activities on environmental conservation for the citizens and school/college children in and around Mysuru
- If not already available, establish herbal/medicinal garden to improve awareness of Indian traditional home remedies for common ailments. Sustain the existing herbal/medicinal garden to improve awareness of Indian traditional house remedies for common ailments.
- Vertical garden can be adopted.

### **CARBON FOOTPRINT**

- Encourage a system of car-pooling among the staff to reduce the number of four wheelers coming to the college.
- Encourage students and staff to use cycles.
- Establish a more efficient cooking system to save gas.
- The campus has initiated the successful No Vehicle Day on Saturday Program to reduce the pollution caused by the transportation and hence reduce the overall carbon footprint of the campus
- Discourage the students using two wheelers for their commutation.
- More use of generators every day should be discouraged.

### **CAMPUS SAFETY**

- Fire safety drill is conducted for all faculty and staff
- Ensure material safety data sheets are maintained in the laboratories and are placed in easily accessible locations for quick reference.
- Ensure laboratory Dos and Don'ts are strictly adhered to.
- Noise proof wall or noise insulated materials can be used, to reduce the outdoor noise.



**campus and the Audit team visit to the campus of JSS College of Pharmacy, Ooty**



**Safety measures taken at LPG cylinder storage area**



**Lab safety instructions at JSS College of Pharmacy**

**GREEN POLICY OF JSSAHER**

JSS AHER has its Green Policy which emphasizes on the following to be strictly followed in all its campuses.

- ❖ Maintenance of clean, green, and smart campus – waste segregation and planned disposal through authorized agencies only



- ❖ Disposal of biomedical waste, Chemicals, and e-waste as per the norms of the Karnataka State Pollution control Board
- ❖ Energy conservation strategies – For e.g., use of CFL/LED lights and Solar heaters and air source heat pumps in the hostels
- ❖ Plastic-free campuses
- ❖ Conservation of water resources - Rainwater harvesting and wastewater treatment
- ❖ Reducing paper communication
- ❖ The HEI actively organizes Swachh Bharat Abhiyan and creates awareness and consciousness amongst students.
- ❖ Provision for natural light in all its buildings.

## **GREEN CAMPUS**









**PLASTIC FREE CAMPUS**



**P**





**SUSTAINABLE AGRICULTURE (Kitchen Garden in the hostel campus)**





# RENEWABLE SOURCES OF ENERGY





## BICYCLES

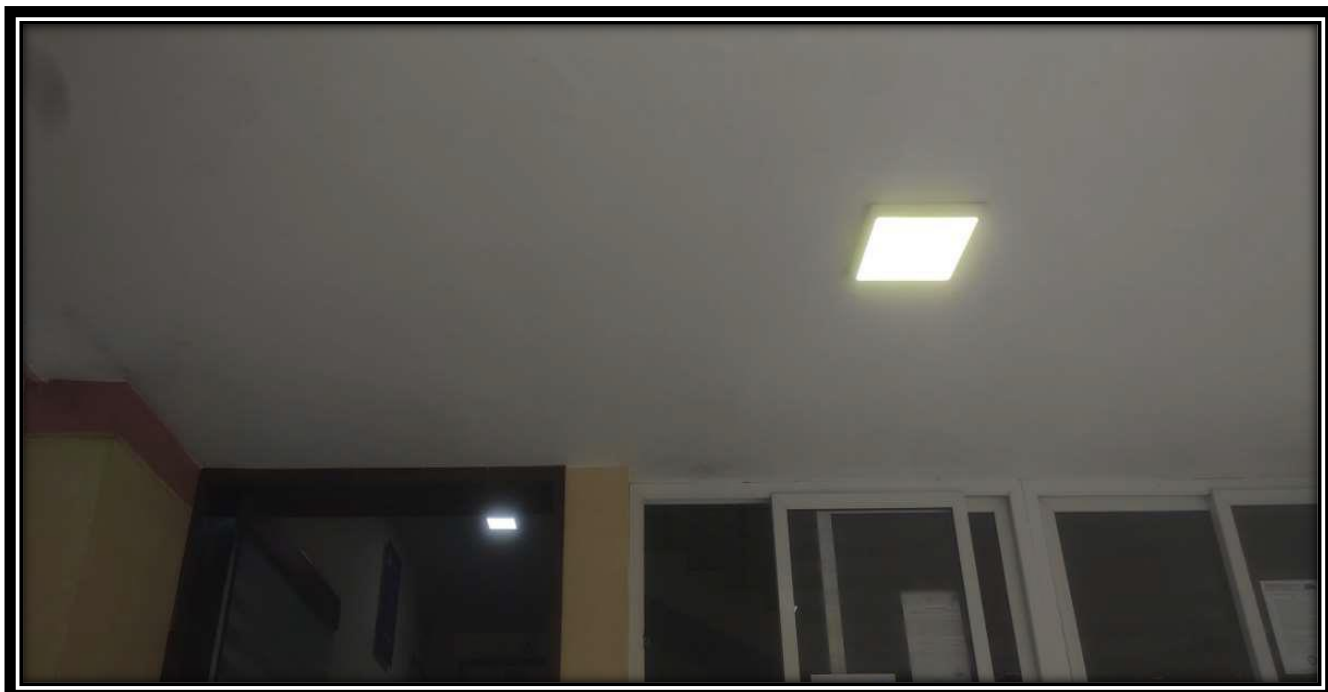
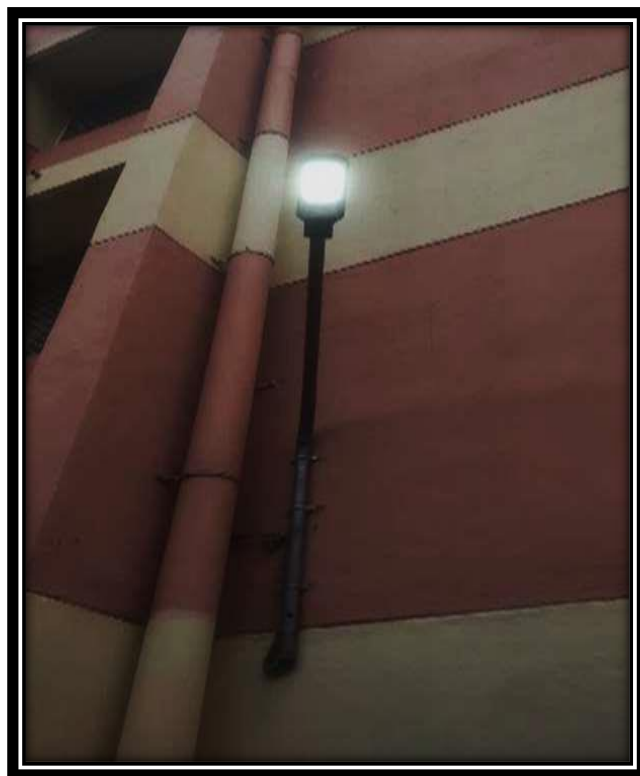


## ELECTRIC BUGGIES & CAR



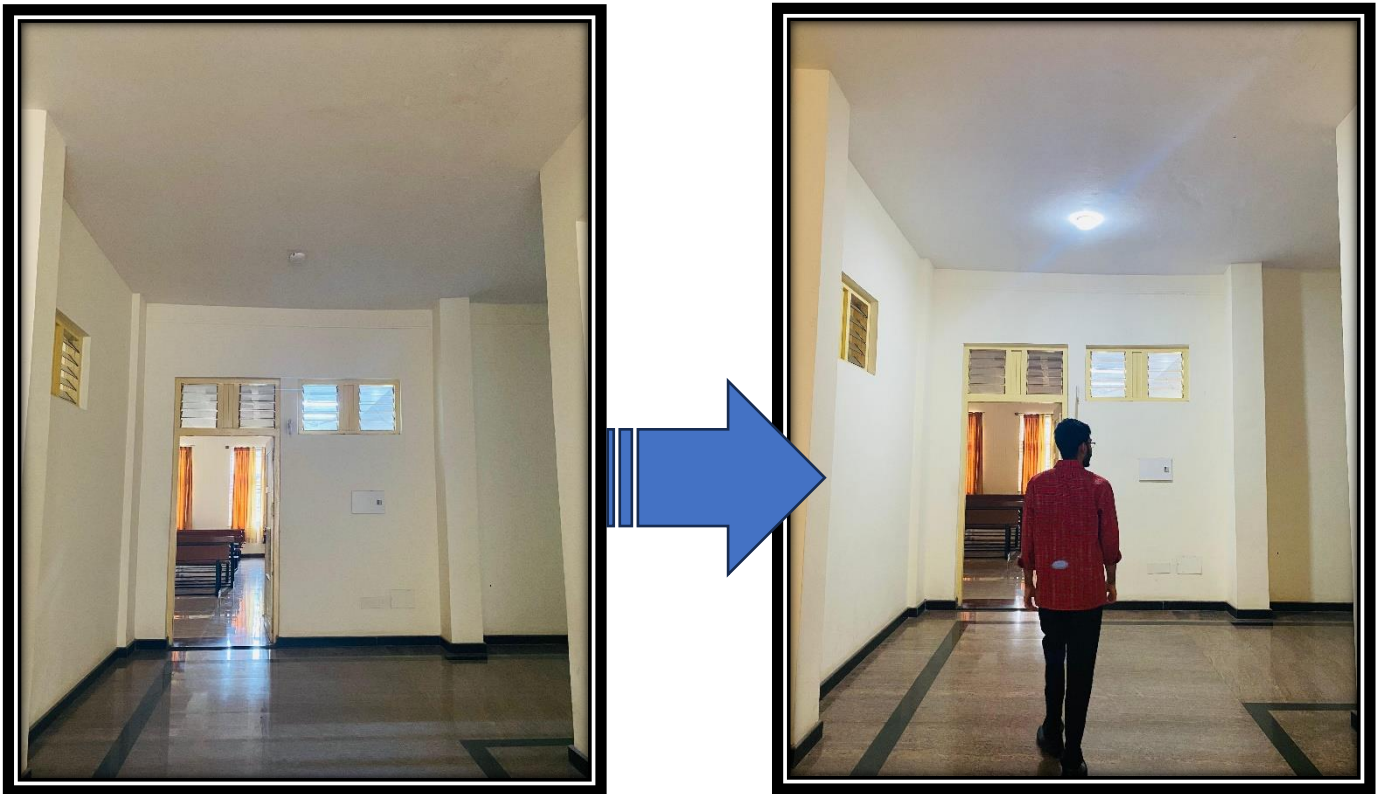
## ENERGY EFFICIENT DEVICES

- ❖ Our implementation includes solar panels and LED as they reduce energy consumption to a great extent.
- ❖ We have provided the pooled-transport systems to students to travel from college to hospital or to other campus to ensure the less use of petroleum fuels.
- ❖ Energy saving ceiling fans



## HUMAN SENSING AUTOMATIC LIGHTING SYSTEM

A human sensing automatic lighting system uses sensors to detect the presence of people in a room or area. These sensors can be motion detectors, infrared sensors, or cameras. When the system senses a person, it automatically turns on the lights, providing illumination without manual intervention. The system enhances convenience and energy efficiency by ensuring lights are only on when needed. It can be particularly useful in offices, homes, or public spaces, helping reduce energy consumption and costs. Additionally, it can be integrated with smart home systems for greater control and customization.





## VERMICOMPOSTING

Vermicomposting is a simple biotechnological process of composting, in which certain species of earthworms are used to enhance the process of waste conversion and produce a better end product.

A team started the project Vermicomposting in JSS AHER campus. The prior knowledge and the assistance for the vermicomposting were received by the direction of scientists from the ICAR JSS KVK, Mysore.



## RAINWATER HARVESTING



Rainwater harvesting collection tank of 30,000 Litres storage capacity. 10 no's of Groundwater & bore well recharge pits and infiltration tank of about 15,000 Litres capacity. STP of 25 KLD capacity by using SWR technology has been installed for treating sewage & kitchen wastewater of PG Guest Hostel & the treated water is used for the gardening area developed surrounding the building. One tank of 10,000 litres capacity is made for reuse of RO rejected water for gardening Purposes Water sprinklers are in place.

## WASTE MANAGEMENT

### I. Biomedical waste management

Biomedical waste management in the JSS hospital, Medical College, and allied health centres follow the Biomedical Waste Management Rules 2016.

Generated Biomedical waste in health centres follows the following step before it is treated.

**Instructions are also mentioned in regional language**

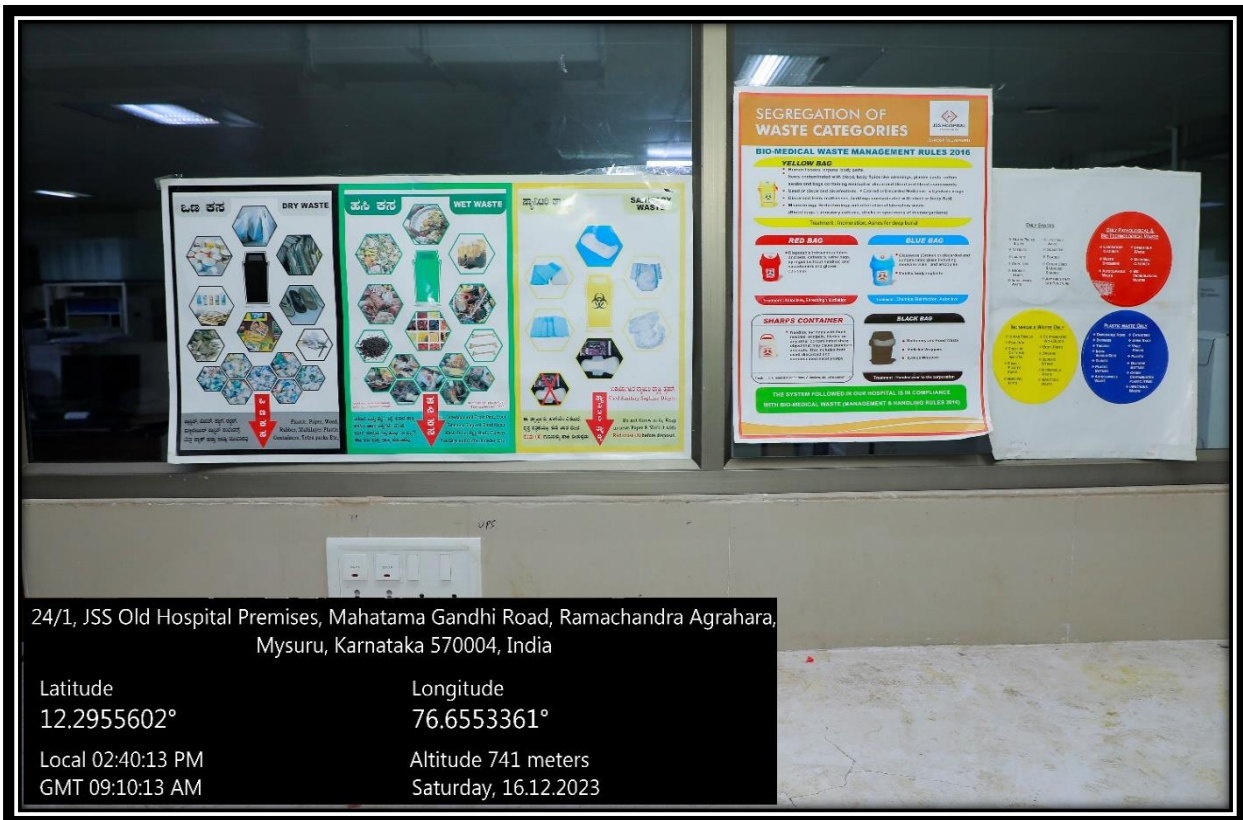
### II. General waste

- ❖ Segregation and collection of dry and wet garbage are in practice.
- ❖ Color-coded dustbins are provided across the campus
- ❖ Waste collection by municipal lorries regularly from all the sites.
- ❖ Swachh Sarvekshan posters are put up in various places in the hospital, medical college, and hostel premises.





**Mysuru, Karnataka, India**  
 7MW4+2CV, JSS Hospital Rd,  
 Ramachandra Agrahara, Mysuru, Karnataka  
 570004, India  
 Lat 12.294819°  
 Long 76.656067°  
 16/12/23 12:11 PM GMT +05:30



24/1, JSS Old Hospital Premises, Mahatma Gandhi Road, Ramachandra Agrahara,  
 Mysuru, Karnataka 570004, India  
 Latitude 12.2955602° Longitude 76.6553361°  
 Local 02:40:13 PM Altitude 741 meters  
 GMT 09:10:13 AM Saturday, 16.12.2023

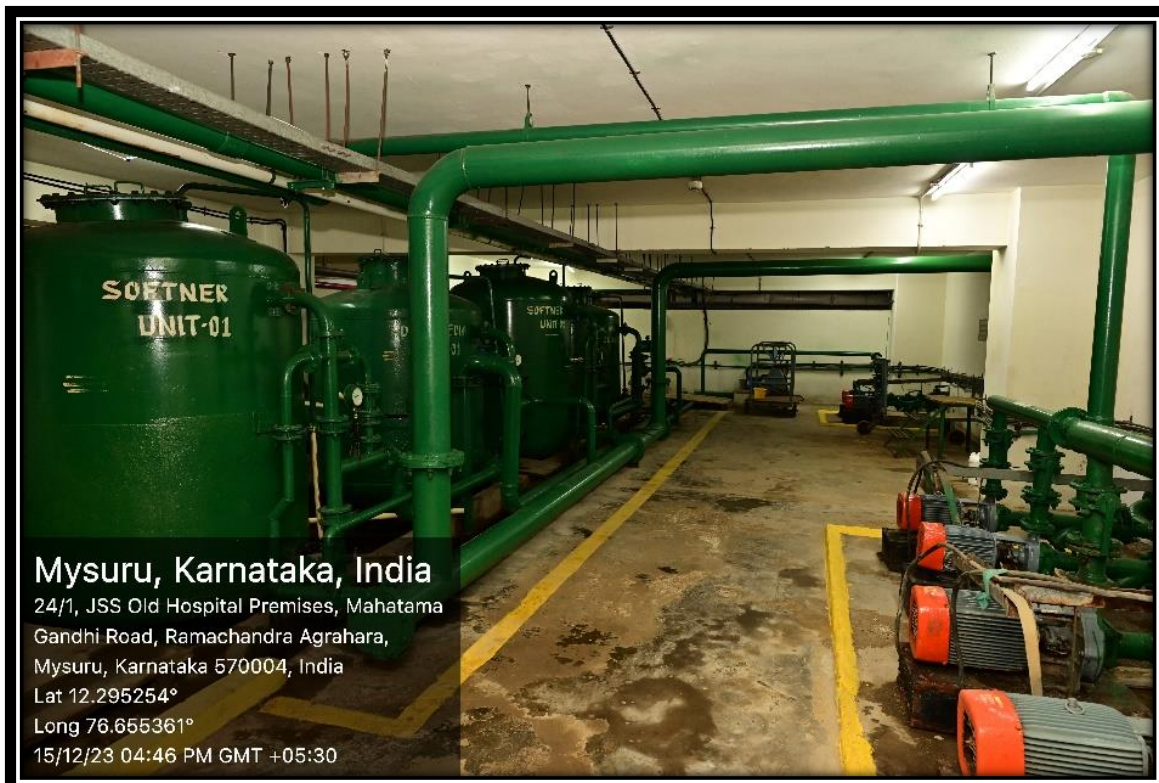


# SEWAGE TREATMENT PLANT





## WATER TREATMENT PLANT (HOSPITAL)



## **OXYGEN PLANT**

With the Divine presence of His Holiness Swamiji, Sri. Basavaraj S Bommai, Hon'ble Chief Minister, Govt. of Karnataka inaugurated Oxygen Plant on 26.12.2021 at 4.30 p.m. at JSS Hospital, Mysuru. Dr. K Sudhakar - Hon'ble Minister for Health & Family Welfare and Medical Education and other dignitaries were present in the inauguration program.

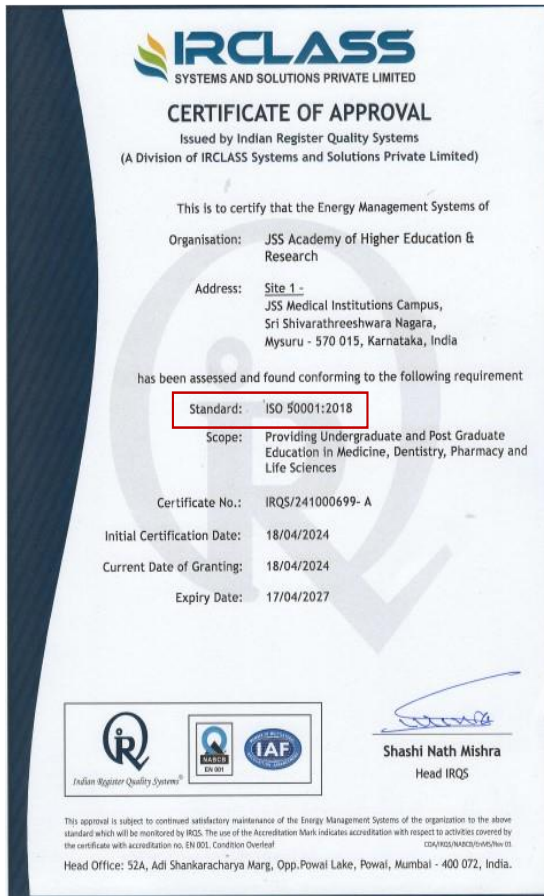
In view of creating a greater number of oxygen beds due to the high demand, the management has decided to increase LMO tank capacity, accordingly we have installed additional 13KL capacity of LMO plant along with the existing 13KL capacity tank at our hospital on 29-11-2021.

We had successfully treated 5000 COVID patients at our hospital with 205 oxygen lines during first wave of COVID-19 pandemic. During 2nd wave nearly 2000 COVID patients from Mysore and surrounding regions have been treated by extending another 150 oxygen beds.





**JSS Medical College campus has successfully been certified for ISO 50001:2018 (Energy Management systems) and ISO 14001:2015 (Environmental Management systems) on 18-04-2024**



**IRCLASS**  
SYSTEMS AND SOLUTIONS PRIVATE LIMITED

**CERTIFICATE OF APPROVAL**  
Issued by Indian Register Quality Systems  
(A Division of IRCLASS Systems and Solutions Private Limited)

This is to certify that the Energy Management Systems of

Organisation: JSS Academy of Higher Education & Research

Address: Site 1 -  
JSS Medical Institutions Campus,  
Sri Shivarathreeswara Nagara,  
Mysuru - 570 015, Karnataka, India

has been assessed and found conforming to the following requirement

Standard: **ISO 50001:2018**




Scope: Providing Undergraduate and Post Graduate Education In Medicine, Dentistry, Pharmacy and Life Sciences


Certificate No.: IRQS/241000699- A

Initial Certification Date: 18/04/2024

Current Date of Granting: 18/04/2024

Expiry Date: 17/04/2027

  
Shashi Nath Mishra  
Head IRQS

This approval is subject to continued satisfactory maintenance of the Energy Management Systems of the organization to the above standard which will be monitored by IRQS. The use of the Accreditation Mark indicates accreditation with respect to activities covered by the certificate with accreditation no. EN 001. Condition Overleaf  
004/IRQS/NAR03/EN01/24/01

Head Office: 52A, Adi Shankaracharya Marg, Opp.Powal Lake, Powal, Mumbai - 400 072, India.



**IRCLASS**  
SYSTEMS AND SOLUTIONS PRIVATE LIMITED

**CERTIFICATE OF APPROVAL**  
Issued by Indian Register Quality Systems  
(A Division of IRCLASS Systems and Solutions Private Limited)

This is to certify that the Environmental Management Systems of

Organisation: JSS Academy of Higher Education & Research

Address: Site-1: JSS Medical College,  
JSS Medical Institutions Campus,  
Sri Shivarathreeswara Nagara,  
Mysuru - 570 015, Karnataka,  
India

has been assessed and found conforming to the following requirement

Standard: **ISO 14001:2015**

Scope: Providing Undergraduate And Post Graduate Education In Medicine

Certificate No.: IRQS/240300698/A

Initial Certification Date: 16/04/2024

Current Date of Granting: 16/04/2024

Expiry Date: 15/04/2027




  

  
Shashi Nath Mishra  
Head IRQS

This approval is subject to continued satisfactory maintenance of the Environmental Management Systems of the organization to the above standard which will be monitored by IRQS. The use of the Accreditation Mark indicates accreditation with respect to activities covered by the certificate with accreditation no. EM-005. Condition Overleaf  
004/IRQS/NAR03/EM/24/01

Head Office: 52A, Adi Shankaracharya Marg, Opp.Powal Lake, Powal, Mumbai - 400 072, India.

**GUEST LECTURE DELIVERED BY THE FACULTY**

S.No.	Name of the faculty	Title	Date & Venue	Certificate / Photos
1	Dr. Thanzeemunisa	Paediatric allergy update and AST Workshop Talk : Allergic Rhinitis and asthma –close link in children	7 <sup>th</sup> April 2024 JK Ground MMCRI, Mysuru	
2	Dr. Mahesh P A	Air Pollution Exposure & Respiratory Toxicology	2 <sup>nd</sup> to 4 <sup>th</sup> January 2024 JSSAHER Mysuru	
3	Dr Sulochanadevi B C Dr Sreena V, School of Public Health	Open WHO course on 'Air pollution and health: an introduction for health workers	13-01-24 WHO course online	 



## PUBLICATIONS

S. No.	Title of the paper	Name of the author	Title of the journal	Year of publication	Citation Index		Bibliometrics
					Scopus	Web of Science	
1	Allergic rhinitis in India	Subhabrata Moitra., Dr Mahesh P.A., Saibal Moitra	Clinical and Experimental Allergy	2023	4	4	-
2	Association between drinking water fluoride and the serum alkaline phosphatase and phosphate levels in pregnant women and newborn infants	Thippeswamy Honne Manjunathappa., Dr Devananda Devegowda., Nanditha Kumar Mysore., Prashanth Vishwanath., Dr Prashanth S N	Dental and Medical Problems	2023	0	0	-
3	A Proteomics Investigation of Cigarette Smoke Exposed Wistar Rats Revealed Improved Anti-Inflammatory Effects of the Cysteamine Nanoemulsions Delivered via Inhalation	Sanniya Middha., Koustav Ganguly., Gautam Sharma., Swati Pund., Rajkumar Govindan., Mehar Un Nissa., Deeptarup Biswas., Dr Mahesh P A., Rinti Banerjee., Sanjeeva Srivastava	OMICS A Journal of Integrative Biology	2023	0	0	27(8): 338-360
4	Unmasking the Silent Threat: Periodontal Health's Impact on COPD Severity and Hospitalization	Dr Anitha S., Komarla Sundararaja Lokesh., Sindaghatta Krishnarao Chaya., Mohammed Kaleem Ullah., Dr Jayaraj B S., Dr Nandlal B., Padukudru Anand Mahesh	Journal of Personalized Medicine	2023	0	0	13(12)
5	Risk factors associated with symptoms of asthma in India	Sabir Mohammed., Sanjay K Kochar., Udaiveer Singh., Bhushan Girase., Nishtha Singh., Singh., Sundeep Salvi., Dr Mahesh P.a.,	European Respiratory Journal	2023		0	62(Supplement 67)
6	Geospatial Mapping of Indoor Air Quality and Respiratory Illnesses in an Urban Slum	Samyak T Shah., Dr Nayanabai Shabadi., Rohan Karkra., Vadaga V Rao	Cureus	2023		0	15(2): 1-8
7	Assessment of wood smoke induced pulmonary toxicity in normal- and chronic	Gunnar Johanson., Lena Palmberg., Koustav Ganguly., Swapna Upadhyay.,	Respiratory Research	2024	0	0	25(1): 1-22

bronchitis-like bronchial and alveolar lung mucosa models at air-liquid interface	Mizanur Rahman., Selina Rinaldi., Jeremy Koelmel., Elizabeth Z Lin., Dr Mahesh P.a., Johannes Beckers., Krystal J Godri Pollitt., Martin Irmeler					
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### Ongoing Projects

Funding Agency	PI/Co PI* & Dept	Area of research	Funds in rupees	Instruments	Manpower
ICMR	Dr.Rajesh Kumar T Biochemistry MPH Uni. of Mysuru	Phytoremediation of indoor air pollution	16,75,000	Customized plant wall filtration system  Electro chemical sensor-10 Units  NOx & VOC	Project Tech. support-III-2  Project Tech.support-I-1
DBT	Dr. Rajesh Kumar T. & Dr.P A Mahesh Biochemistry & Respiratory Medicine	Air Pollution Exposures on Lung growth and development of biomarker of lung function	3,50,00,000	Spirometer velocimeter 10 Lakhs	JRF-1 PA-1 FW-3 Ph.D. Enrolled
Swedish Heart Lung foundation, Karolinska Institute	Dr. Mahesh P A Respiratory Medicine	Adverse effect of outdoor and indoor air pollution	15,00,000	Nil	Nil
Swedish Heart Lung foundation, Karolinska Institute	Dr. Mahesh P A Respiratory Medicine	Molecular pathomechanism of biomass smoke induced chronic obstructive pulmonary disease	65,00,000	Spirometer (Model: NDDEasyone Air) CO Check Device (Model: CO Check Pro) FeNO Measurement Device (Model: Fenom Pro) FeNo Consumables - Digital License with Filter Finger tip pulse oximeter (Model: Oxy3000) Rs.9,13,000	RA-02
University of Birmingham	Dr. Mahesh P A Respiratory Medicine	Characterize Asthma and allergic rhinitis in the Indian population	20,00,000	Spiro meter Rs.1,77,000/-	NIL
ICMR	Mr. Kaustubh Gaur	Relationship of traffic noise exposure and	50,000.00		

	<b>Dr.Praveen Kulkarni</b>	<b>ambient PM 2.5 levels with arterial blood pressure perceived stress and sleep quality among street traders at Mysuru city Karnataka</b>			
	<b>Dr. B.S.Jayaraj Professor JSSMC, Mysuru</b>	<b>The role of air pollution and pollen exposure on asthma Mysore, India</b>	<b>10,00,000.00</b>		

### Research Collaborations & Consultancies

<b>SI No</b>	<b>Collaboration with Institution name</b>	<b>Area</b>	<b>Objectives</b>	<b>Outcomes</b>	<b>Financial details</b>	<b>MOU/MOA</b>
<b>1</b>	<b>IIT Madras</b>	<b>Air pollution</b>	<b>Community based projects on biomass fuel and particulate matter</b>	<b>Ongoing research project</b>	<b>--</b>	<b>--</b>
<b>2</b>	<b>Indian Institute of Technology-Bombay (IIT-B), Mumbai</b>	<b>Air pollution and lung function</b>	<b>Lung function in children and effects of long-term exposure to traffic induced pollution</b>	<b>Ongoing research</b>	<b>--</b>	<b>MOA</b>

### Outreach Activities

## SRI SUTTUR JATHRA MAHOTSAVA - 2024

### JSS MEDICAL COLLEGE AND HOSPITAL EXECUTIVE SUMMARY OF MEDICAL EXHIBITION



The annual Jathra Mahotsava of Adi Jagadguru Sri Shivarathreeshwara Shivayogi Mahaswamigalu, held at Suttur Sriksheeta from February 6th to 11th, 2024, showcased a multitude of programs and exhibitions aimed at fostering scientific and educational awareness among rural communities. The medical exhibition, inaugurated by His Holiness Jagadguru Sri Shivarathri Deshikendra Mahaswamiji, focused on the theme "**Healthy Lungs – Healthy Life: Every breath counts,**" emphasizing respiratory health education and preventive measures.

The medical exhibition by JSS Medical College and Hospital received 2<sup>nd</sup> prize at the Jathra Mahotsava for its efforts and commitment towards generating health awareness among the public.

## Key Highlights:

- The exhibition featured 17 departments of JSS Medical College and Hospital, engaging thousands of visitors daily, including individuals of all ages.
- Departments like Anatomy, Physiology, Biochemistry, and Medical Genetics offered interactive displays, demonstrations, and educational materials on respiratory anatomy, lung function, genetic disorders, and preventive measures.
- Activities ranged from respiratory health quizzes, lung function testing, and deep breathing demonstrations to screenings for oxygen saturation and pulse rate using point-of-care testing devices.
- Departments like Pathology, Microbiology, and Pharmacology showcased models, posters, and educational games on lung pathologies, infections, and pharmacological interventions.
- Department of Community Medicine initiatives were community-focused activities included interactive games, puppet shows, movie screenings, and clean air pledges to promote awareness and behavioral change regarding respiratory health.
- Specialty departments such as Forensic Medicine highlighted safety measures related to gas geyser usage and drowning prevention, while Psychiatry focused on tobacco cessation and sexual health education.
- **The School of Public Health emphasized air pollution awareness, preventive measures, and the importance of mask-wearing and social distancing.**
- Feedback from attendees lauded the innovative and informative exhibits, with the JSS Medical College & Hospital exhibition receiving recognition and praise for its impactful contributions.

## Shramadaan at K R Mills by JSS Medical College, Mysuru – 09-03-2024



As part of Family Adoption Program, along with NSS, **“Shramadaan”**- Giving back to community-activity was organized on 9<sup>th</sup> March 2024 at K R Mills colony, Hanchya PHC, Mysore. As part of the program 1<sup>st</sup> year MBBS students were involved as NSS volunteers and carried out cleaning of the premises of KR Mills Subcentre, Government Model Higher primary School, KR mills and Government High School, K R mills. The students also gave health education to school students on importance of segregation of dry and wet waste at household level, personal hygiene and hand hygiene. Dr. Shwetha Kurkuri, Dr. Sunitha Singh, Senior Residents, Dept of Community Medicine, Dr. Amoghashree, Asst. Prof., Dept. of Community Medicine, Dr. Ravishankar, Asst. Prof., and NSS Co-ordinator, Dept. of Anatomy, JSS Medical College, Mysuru along with Post graduates from the Dept. of Community Medicine, JSS Medical College, coordinated the whole event. Support was



also extended by Dr. Sunil Kumar D, HOD, Dept. of Community Medicine, JSS Medical College, Gram Panchayat, Siddlingipura, Dr. Ravidra, Medical Officer, Hanchya PHC, Mysuru for the event.

**Indo Swedish Conference on “Air Pollution and Respiratory Toxicology” and Workshop on “Methods of Assessing Cytotoxicity, Anti-oxidant, Anti-inflammatory and Reactive Oxygen Species (ROS)” - 2<sup>nd</sup> to 4<sup>th</sup> January 2024**

The Department of Respiratory Medicine along with the Department of Biochemistry (DST-FIST Supported Department), JSS Medical College, Mysore Karnataka in collaboration with Department of Environmental Science and Engineering, Indian Institute of Technology Bombay, (IITB), Mumbai, Maharashtra, India and Institute of Environmental Medicine (IMM), Karolinska Institutet, Stockholm, Sweden have organized Indo Swedish one day conference on “Air pollution and Respiratory Toxicology” and 2 day’s workshops on “Methods of Assessing Cytotoxicity, Anti-oxidant, Anti-inflammatory and Reactive Oxygen Species (ROS)” from 2<sup>nd</sup> to 4<sup>th</sup> January 2024. This event is supported by Ministry of Education, Govt of India, under Scheme for Promotion of Academic and Research Collaboration (MoE-SPARC).

The conference was designed to understand the role of air pollution on human health and to explore the recent strategies to combat the same while the workshop focused on various techniques crucial in deciphering the impact of pollution by assessing Cytotoxicity, Anti-oxidant, Anti-inflammatory and Reactive Oxygen Species (ROS)

A total of 29 participants had registered for the conference and 14 participants were registered for the workshop. During the course of workshop, participants were exposed to a wide array of techniques: Demonstration of cell culture, plating of cells in 96-well microtiter plates, cell viability determination by MTT, ROS assessment, ELISA, Lipid peroxidation estimation with serum and LDL. In addition, antioxidant assay using colorimetric methods such as FRAP, DPPH, DCFH-DA were also demonstrated to the workshop participants.



## **WORLD NO TOBACCO DAY – 31-05-2024**

World No Tobacco Day was observed in collaboration with the Department of Psychiatry, JSS Hospital, on May 31, 2024, at 12 pm. The chief guest was Dr. C.P. Madhu, Medical Superintendent of JSS Hospital, Mysuru. Posters on the dangers of tobacco use were displayed at JSS Hospital to create awareness regarding the health hazards related to tobacco use.

Mrs. Purohit Saraswati, Assistant Professor and HOD of the Department of Mental Health Nursing, conveyed the significance of World No Tobacco Day to the public at JSS Hospital. Dr. Kishore M., Professor of Psychiatry at JSS Medical College and Hospital, Mysuru, delivered the keynote address on World No Tobacco Day. Dr. C.P. Madhu, Medical Superintendent of JSS Hospital, Mysuru, addressed the gathering regarding the importance of quitting tobacco and the associated health benefits. Prof. Aswathy Devi M.K., Principal of JSS College of Nursing, graced the program, as did Dr. Pradeep Kumar, Psychiatrist at JSS Hospital, Mysuru.

A role play was performed by II Semester BSc Nursing students under the guidance of Dr. Pradeep Kumar to create awareness regarding the effects of tobacco use among the public. Patients of JSS Hospital benefited from the program. Prizes for the winners of the poster-making competition were distributed during the event. The program concluded at 1 pm.



## **E-Learning module on tobacco counselling – 22-01-2024**

E-Learning Module on Tobacco Counselling! This interactive and comprehensive online program has been designed to equip healthcare professionals with the knowledge and skills necessary to provide effective tobacco counselling to their patients. Dr. Chandrashekar B R, MDS, PhD, FAIMER 2017 Fellow. Associate Dean (Academics), Professor, Department of Public Health Dentistry, JSS Dental College and Hospital, JSS Academy of Higher Education and Research, Mysuru enumerated the reasons for tobacco initiation and dependence, Factors related abuse liability and tobacco industry tactics to promote abuse liability of product and how to Motivating young children's not to experiment the tobacco.

### **Important points**

- Abuse liability and tobacco industry tactics
- Abuse liability: manipulation of dependence potential and attractiveness that can contribute to harm directly
- Making attractive cigarettes for young children
- Tobacco pack surveillance; Tobacco pack surveillance refers to the systematic and ongoing monitoring of tobacco product packaging for various purposes, including compliance with regulations, public health research, and policy evaluation. This surveillance involves the collection, analysis, and reporting of information related to the packaging and labelling of tobacco products. Here's an overview of the key aspects of tobacco pack surveillance.
- Nicotine stimulate nicotine has stimulant effects, tobacco use and nicotine addiction are associated with numerous health risks, including cardiovascular diseases, respiratory problems, and an increased risk of various cancers. Quitting smoking or using nicotine replacement therapies under medical guidance is recommended for those looking to break the cycle of nicotine dependence.
- Tobacco use prevalence
- Tobacco industries
- Narcotic effects of nicotine
- Autopsy studies 400% increase in nicotine receptors among smokers compared to non-smokers
- Ammonia technology is the key to competing smoke quality with (Philip mirror) world wide



## **WORLD ENVIRONMENT DAY – 05-06-2024**

**World Environment Day was celebrated by tree plantation in the campus on**



5th June 2024



### INTERNATIONAL VISITS BY FACULTY/STUDENTS

Dr. MVSST Subba Rao & Dr. Rajesh Kumar T, Professors, Department of Biochemistry participated in **Indo-Sweden Workshop on Household Air Pollution and Health** as delegates at Karolinska Institute, Stockholm, Sweden from 25<sup>th</sup> to 29<sup>th</sup> September 2023.





**Karolinska Institutet**  
**Institute of Environmental Medicine**  
 Unit of Integrative Toxicology  
 Swarna Upadhyay, PhD, ERT, Docent  
 Associate professor  
 To:  
**Prof. MV Subbierao**  
 Department of Biochemistry  
 JGS Medical College and Hospital  
 JGS Academy of Higher Education and Research  
 Mysuru, India 570012

Invitation Letter  
 27<sup>th</sup> October, 2023  
 Page: 1 / 1

Kouslav Ganguly, PhD, ERT, Docent  
 Associate professor



**Karolinska Institutet**  
**Institute of Environmental Medicine**  
 Unit of Integrative Toxicology  
 Swarna Upadhyay, PhD, ERT, Docent  
 Associate professor  
 To:  
**Prof. Rajesh Thimmulappa**  
 Department of Biochemistry  
 JGS Medical College and Hospital  
 JGS Academy of Higher Education and Research  
 Mysuru, India 570012

Invitation Letter  
 27<sup>th</sup> October, 2023  
 Page: 1 / 1

Kouslav Ganguly, PhD, ERT, Docent  
 Associate professor

**Subject:** Certificate of participation at the Indo-Swedish workshop and conference at Karolinska Institutet, Stockholm, Sweden between 25<sup>th</sup> – 29<sup>th</sup> September 2023.

I Dear Prof. MV Subbierao,

On behalf of the organizing committee, we would like to express our sincere gratitude and thank you for your participation at the Indo-Swedish workshop and conference on Household Air Pollution and Health (HAP-H) 2023 held at the Institute of Environmental Medicine (IEM), Karolinska Institutet, Stockholm, Sweden between 25<sup>th</sup> – 29<sup>th</sup> September 2023.

The meeting was organized in connection with the collaborative project titled "Household air pollution: insight into the mechanisms of adverse respiratory effects towards transnational knowledge sharing" funded by the STINT, The Swedish Foundation for International Cooperation in Research and Higher Education.

The workshop attendees were enriched through your lectures, discussion sessions, and student led interactions.

We hope you enjoyed your stay in Stockholm between 23<sup>rd</sup> - 30<sup>th</sup> September 2023 and look forward to developing our collaboration in the near future.

With best greetings

*Swarna Upadhyay*  
 Swarna Upadhyay

*Kouslav Ganguly*  
 Kouslav Ganguly

(Joint Convenors)

**Subject:** Certificate of participation at the Indo-Swedish workshop and conference at Karolinska Institutet, Stockholm, Sweden between 25<sup>th</sup> – 29<sup>th</sup> September 2023.

I Dear Prof. Rajesh Thimmulappa,

On behalf of the organizing committee, we would like to express our sincere gratitude and thank you for your participation at the Indo-Swedish workshop and conference on Household Air Pollution and Health (HAP-H) 2023 held at the Institute of Environmental Medicine (IEM), Karolinska Institutet, Stockholm, Sweden between 25<sup>th</sup> – 29<sup>th</sup> September 2023.

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With best greetings

*Swarna Upadhyay*  
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*Kouslav Ganguly*  
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(Joint Convenors)

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Org. number: 20210 2973

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## Foundation Course for Phase 1 Students (2023-24 batch) from 09<sup>th</sup> September to 15<sup>th</sup> September 2023

**Dr. Ranjitha Shankare Gowda** spoke on patient **safety and biohazard safety**. She described the types of error during daily practice like medication errors, antimicrobial resistance, healthcare associated infections and others. She discussed about biomedical wastes management. How the biomedical wastes are generated in the hospital, what are the hazards related to that and how to manage.

**Dr Rashmi** started the session by introducing types of **biomedical waste** and generation of wastes in hospital settings. She has discussed basic concepts of biosafety and its implementation while handling biohazard materials. She explained the importance of waste segregation immediately after generation in the hospital and color codes for segregating different types of biomedical wastes after procedures. She discussed all 4-color coded based segregation method including yellow, red, blue, and white. Besides segregation, she also discussed on several methods of treatment of these biomedical wastes, and precautions during waste segregation. She briefly explained on Hospital acquired infection and contribution of biomedical wastes in several HAI. She made students aware of blood borne viruses (BBV) and discussed safety measures to avoid the spread of cross infections through biomedical wastes.

## World Environmental Day – 25-07-2023

**“What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and one another.” – Mahatma Gandhi**





A healthier environment is the need of the hour and we must not make any more delays. World Environment Day (WED) is celebrated to encourage and create awareness and to take appropriate action for the protection of the environment. It is supported by many organizations worldwide. In this regard to mark the activity, NSS unit JSS Medical College, Mysuru, conducted the sapling implantation program on 25<sup>th</sup> July 2023 in the medical college campus garden. Faculty and NSS student volunteers actively participated and witnessed the event.

Dr. Basavana Gowdappa H, Principal of JSS medical college, Dr. Suma M.N., and Dr. Praveen Kulkarni, vice-principals of JSS Medical College, and Mr. Sathish Chandra, Administrative officer of JSS Medical College, Sports director Mr. Lokeshappa H, implanted number of saplings in the garden to mark this event. The NSS

volunteers also implanted the saplings in the same garden. This program was coordinated by NSS program officers NSS unit, at JSS Medical College, Mysuru.

### **Tree sapling – Observation of Independence Day – 14-08-2023**

Department of Community Medicine, JSS Urban Health Center, JSS Medical College, Mysore had organized Tree saplings Planting Program in association with Rajeev Sneha Balaga under public private partnership at JSS Urban Health Centre on 14.08.2023 on the eve of 77<sup>th</sup> Independence Day.

10 saplings (Medicinal &floral) were planted in JSS Urban Health Centre Garden. Smt. Lakshmi Rajeev, Rajeev Sneha Balaga, Smt. Sandhya Suresh, Secretary Inner Wheel Club of Mysore Midtown, Dr. M.C. Prasad, Assistant Professor, Dept of General Medicine, Dr. Amoghashree, Assistant Professor & JSS UHC Coordinator, Dr. Noor Fathima, Assistant Professor, JSS Ayurveda College, Dr. Rama H.V, Lady Medical Officer & staffs of JSS Urban Health Centre Planted the saplings.



## Awareness Programme on Substance abuse and Observation of World Ozone Day – 16-09-2023

An awareness Programme on Prevention & Management of Substance abuse was held for High School children on 16.09.2023 at Government High School, Medar's Block, Bamboo Bazaar.

Dr. Rama H.V., Lady Medical Officer, JSS Urban Health Center gave a talk on the subject through PPT. She stressed the need for creating awareness to adolescents who are easily Prone to get affected by substance abuse. She also clarified the doubts among students.

A Role play by High school Girls on the topic was appreciated by everyone. Observation of World Ozone Day also was held on 16.09.2023 Smt. Ningajamma, Science Teacher gave a PPT about importance of Ozone and bad effects caused on earth due to depletion of Ozone layer. She also gave an account of steps to Prevent further depletion of ozone layer. Smt. Pushpavathi Head Mistress Government High School Presided over the Programme. Kumari Rachana completed the Programme. Field staff Sri. Mallikarjuna swamy MSW. Sri. Santhosh H.B Health Inspector. Sri. Sunil Y.S Health assistant JSS Urban Health Centre coordinated the event.



## **“Swachhata Hi Seva” – 01-10-2023**

**"Cleanliness is next to Godliness,"**

- *John Wesley*



“Swachh Bharat Abhiyan” was conducted to disseminate the importance of a **“Sampoorna Swachh Bharath**, to reinforce the concept of sanitation as everyone’s business. To prelude “Swachh Seva” activities, many students and faculty volunteers from JSS Academy of Higher Education and Research, Mysuru conducted cleanliness activities on 1st October 2023 between 9:30 am-11:30 am.

The program involved the commissioner, deputy mayor, and regional corporator of Mysuru city corporation who actively took part and supported the whole event. The



program was started with the felicitation of the corporation authorities by Dr. Praveen Kulkarni, Vice-Principal, JSS Medical, and Dr. Krishna K.L., NSS Programme Officer, JSS AHER College Mysuru.

Dr. Praveen Kulkarni passed the initial remarks about the importance of cleanliness in the health professions by reiterating the significance of the prevention of various communicable and non-communicable diseases. Subsequently, the formal inauguration of the cleanliness drive was marked by the deputy mayor by initiating the cleaning activities at the entrance of JSS AHER. Twenty-five student MBBS NSS volunteers and 10 faculty from JSS MC actively participated in the event and cleaned the streets and parks by plugging various degradable and non-degradable substances in areas coming under the jurisdiction of Sri Shivarathreeswara Nagara.

The activity was supported and encouraged by the Principal and Vice Principal of JSS Medical College, Mysuru; and the administrative officer JSS Medical College, Mysuru. Dr. Krishna K L, NSS programme officer JSS AHER was instrumental in conducting this whole event. The program was supervised and coordinated by NSS program officers NSS unit, JSS Medical College, Mysuru.



## **OUR INITIATIVES FOR CLIMATE ACTION (SDG 13)**

The objective is to incorporate climate change actions, disaster risk management, and sustainable natural resource practices into the country's development plans. This aims to reduce the effects of geophysical disasters on human populations, enhance resilience, and bolster capacity for addressing mitigation, adaptation, and early warning systems.

This is achieved by indicators:

- Following and conforming to the JSS AHER Green policy
- Promoting and maintaining green spaces on the college and hostel premises
- Implementing rainwater harvesting techniques
- Engaging in disaster response initiatives
- Sharing disaster-related research through scientific publications

### **Green Campus Policy and its initiatives**

The college campus boasts a lush green environment, with seasonal trees and regular garden maintenance to ensure its cleanliness. To promote environmental resilience, we have introduced car and scooter pooling for staff and students living in the same area. Additionally, we plan to encourage cycling within the campus and implement a monthly 'No Vehicle Day.' Some students have already embraced this idea and started commuting to college on bicycles.

In the short term, we aim to establish organic farming to meet the demand for vegetables and fruits, and we are in the process of finalizing the land for this purpose. Moreover, the college features an herbal garden displaying various medicinal plants, providing fresh air and relief from ailments. To uphold cleanliness standards, we are considering outsourcing the housekeeping facilities on the campus. Furthermore, we are committed to tree planting initiatives both within the college and in adopted tribal villages to maintain an eco-friendly and green environment.

### **Smart Campus policy and its initiatives**

The Smart Campus committee proposes the installation of low-cost, efficient, and low-carbon energy systems throughout the campus. The University's policies prioritize energy conservation measures and focus on maintaining a green, clean, safe, and eco-friendly campus.

### **Energy from Carbon Source (Diesel Fuel)**

One such initiative is the installation of a New Diesel generator as per the policies quoted by our parent University.

Class-defining technology engine is designed to meet stringent exhaust emission tests as per revised Ministry of Environment, Forest and Climate Change norms, thus offering environment friendly power.

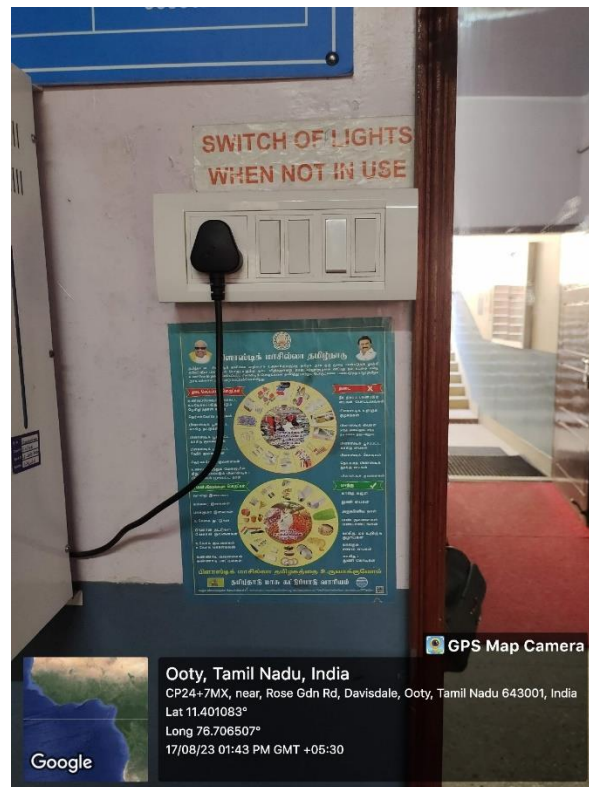
- ▶ Size with Optimum Power to Weight Ratio
- ▶ Smart Aesthetic and Superior Finish
- ▶ Best in Class Transient Response

► Latest Emission Norms

The new higher capacity generator of 250 kW capacity single unit with high power output, more fuel efficient and obeys the latest emission norms.

The estimates of the energy usage in a year are:

Particulars	2023-24	2022-2023	2021-2022
Total energy used (in kWh)	595202	557084	583242
Total energy used from low-carbon sources (in kWh from diesel)	25000	30000	48000
Proportion of electricity from low-carbon sources (in percentage)	4.1 %	5.38 %	8.22 %



## ENERGY MANAGEMENT

- Sources of energy: Electricity, and Diesel generators
- Number of diesel generators: 1 no. (diesel used is 3000 L in the Year 2020-21)
- Number of LED lights: 1235
- Number of T5: 340
- Number of CFL: 85

- Number of Fluorescent: 345
- Number of Solar lamps: 2
- Number of Computers: 138, operating on an average of 5 hours/day
- Printers: 56, operating on an average of 5 hours/day
- Number of Laptops: 13, operating on an average of 5 hours/day
- Number of LCD Projector: 20, operating on an average of 5 hours/day
- Number of Photocopiers: 03, operating on an average of 2 hours/day
- Number of Televisions: 34
- Major electrical equipment (such as hot air oven, Lift, Water Heater, Electrical Heat pumps, Water pumps(motors), refrigerators, etc)



Computers are set to power saving mode. Students and staff are instructed to switch off all electrical appliances when they are not in use.

## GREEN INITIATIVES

- Garden area inside the college: 3.03 acres
- The trees and plants species present in the campus include Walnut, Plums, Peaches
- The percentage of green area, which includes any area which has grass cover, tree cover and horticulture (calculated using the following equation; MGNCRE, 2019) is 31%.

$$\text{The percentage of green area} = \frac{\text{Total green area in square meters}}{\text{Total area in square meters}} \times 100 \times 0.66$$

There is a medicinal garden on campus. Besides, there are large trees across the campus giving much needed greenery and fresh oxygen. Campus has several fruit yielding trees including Plums, Walnut, Peaches among others.

Special lecture programmes are organised by the college to create awareness about the nature. NSS and NCC Students are involved in Swachh Bharat Abhiyaan. Students are involved in sapling



plantations, cleaning and watering the gardens. Several nature awareness programs have been conducted. Connecting with nature is key to understand human dependence on nature and the need to preserve that precious resource. Environmental day is celebrated with active participation from students and staff.

## CARBON FOOTPRINT

- Number of persons using two wheelers: Students: ~75, Faculty: ~50, Visitors: ~10
- Number of persons using four wheelers: Faculty: ~30, Visitors: ~5
- College transport facility: 1 bus and 2 cars

## Rain Water Harvesting Implementation

The college harvests rainwater, which is be utilized for non-potable purposes such as irrigation and flushing toilets. It is stored in a well which covered for prevention of leaf litter contamination.



The objective is to incorporate climate change actions, disaster risk management, and sustainable natural resource practices into the country's development plans. This aims to reduce the effects of geophysical disasters on human populations, enhance resilience, and bolster capacity for addressing mitigation, adaptation, and early warning systems.

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### Environmental education measures

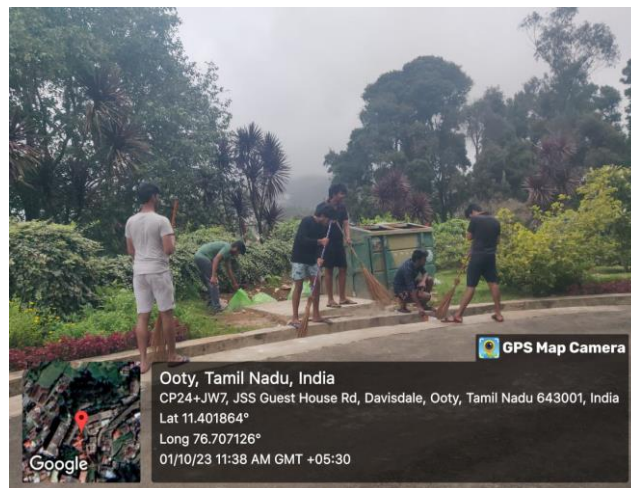
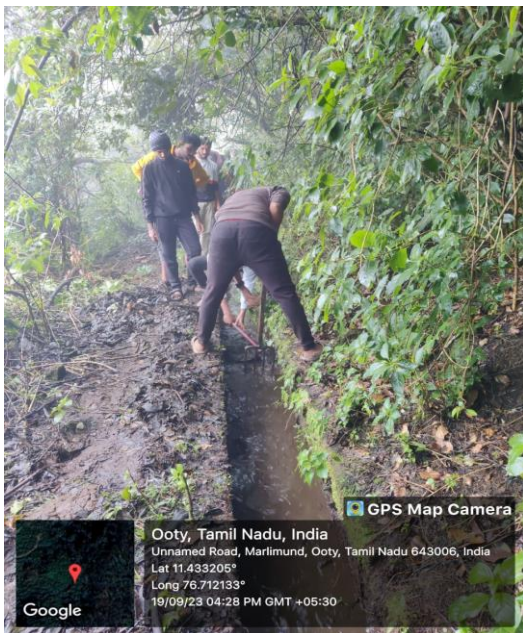
Swachh Bharat Abhiyan is a national cleanliness campaign launched by the Indian government in 2014. Its primary goal is to create a clean and hygienic India by promoting sanitation and hygiene practices. The campaign aims to eliminate open defecation, build and maintain toilets, and improve waste management systems.

Swachh Bharat Abhiyan encourages community participation, urging citizens to take responsibility for their surroundings. The initiative has made significant progress in raising awareness about cleanliness and bringing about positive changes in sanitation across the country.

As a part of environment conservation initiatives and under the banner of Swachh Bharath Abhiyan, the College conducts campaigns on climate change risks, impacts, mitigation, adaptation, impact reduction to the local residents and adopted villages. This is performed with the assistance of National Social Service Scheme of the college.







## Disaster Early Warning and Monitoring System- Landslides

The collaboration between Vellore Institute of Technology (VIT) and the Department of Science and Technology in JSS College of Pharmacy, Ooty, aims to establish a comprehensive forewarning system for landslides in the Nilgiris region. The primary focus is on deploying Tensiometer, an essential geotechnical instrument, to monitor soil moisture and provide crucial data for landslide prediction and early detection.

The Nilgiris region, known for its hilly terrain and frequent heavy rainfall, is prone to landslides, causing significant damage to property and posing risks to human lives. To address this issue, the project seeks to develop a proactive approach to anticipate landslides before they occur. This requires a reliable and accurate system to monitor soil moisture levels, a critical factor influencing landslide occurrences.

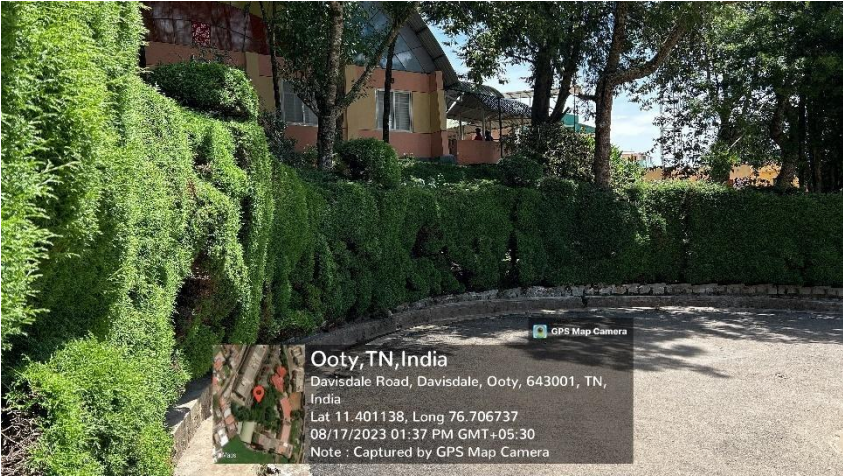
Tensiometer are specialized devices that measure soil moisture tension, which is the force that retains water in the soil against the pull of gravity. By placing Tensiometer at strategic locations within the landslide-prone areas of Nilgiris, researchers can continuously assess soil moisture conditions. This data, combined with weather forecasts and other environmental parameters, will enable the development of predictive models and algorithms to anticipate potential landslide events.



The collaboration brings together experts in geotechnical engineering, environmental sciences, and data analytics, creating a multidisciplinary approach to address the landslide challenges in the region. The project's goal is to provide local authorities and communities with timely and accurate forewarnings, allowing them to take proactive measures to mitigate the impact of landslides and enhance overall disaster preparedness.

Through the successful implementation of the Tensiometer-based forewarning system, the project aims to establish a template for similar initiatives in other landslide-prone regions. By leveraging technological advancements and academic expertise, this collaboration can contribute significantly to safeguarding lives and properties in the Nilgiris and potentially make a positive impact on landslide management practices globally.

Promotion of Green Campus for Pollution free environment







**Medicinal Plants Garden**

**GREEN COVER IN THE CAMPUS**

**Green Audit Report**



**Environmental and Green Audit Report**  
**for**  
**JSS Academy for Higher Education and Research,**  
**Mysuru, Karnataka**

JSS Medical Institutions Campus, SS Nagar, Mysuru -570 015, Karnataka, India

<https://jssuni.edu.in/JSSWeb/WebHome.aspx>





**SAVE ENVIRONMENT SAVE EARTH – IT'S THE ONLY ONE WE HAVE**  
**ENVIRONMENTAL AND GREEN AUDIT**

Conducted by

**STAFF INVOLVED IN ENVIRONMENTAL AND GREENAUDITING:**

**STAFF INVOLVED IN AUDITING – JSS College of Pharmacy, Ooty:**

**Teaching Staff:**

Dr. Dhanabal Palanisamy, Principal  
Dr. Arun Kanniyappan Parthasarathy, Vice Principal,  
Dr. Nagarajan J S K, Associate Professor,

**Non -Teaching Staff:**

Shri Basavalingadevaru H K, Administrative Officer  
Shri Prajwal M S, Asst. Administrative Officer  
Shri Arun Kumar N, Asst. Engineer  
Shri Mahesh N, Junior Assistant  
Shri Veerabhadraswamy K M, Electrician

## **KEY FINDINGS AND OBSERVATIONS- – JSS College of Pharmacy, Ooty**

### **GENERAL**

Total number of students in JSS College of Pharmacy, Ooty is 1,035 with 51 teaching staff and 58 non-teaching staff. The college has 16 classrooms, 19 laboratories, a play ground, ample parking space, lush green garden/landscape area on campus.

### **WATER**

- Main uses of water in the campus: Drinking, Laboratory, Canteen, Garden, Cleaning, Toilets, Bathrooms, Hostels, Guest house, Washing, Office uses.
- Sources of water: Municipality (30,000 L/day) and purchase from private agencies (60,000 L/day)
- Water storage: Sump (2 numbers of 10,000 L each) and Overhead tank – OHT (1 number of 1,00,000 L)
- Quantity of water pumped every day, from sump to overhead tank: ~80,000 L
- No. of water taps on campus: Common areas – 19, Guest House – 132, Boy's hostel – 148, Girl's hostel – 174, Auditorium – 7, College block – 12
- Number of water taps and usage in canteen: Canteen – 2Nos, Amount of water used – 300 L/day
- No. of water taps in laboratories: 127 and water used is ~ 2000 L/day
- Number of RO units: 04
- Number of toilets on campus: Guest house – 21, boy's hostel – 70, girl's hostel – 74, College – 24, and Urinals – 12 Nos
- Quantity of water used in hostel: Boys' Hostel ~ 42,000 L/day and Girls Hostel ~ 50,000 L/day
- Quantity of water used for cleaning the vehicles of the Institute: 100 L/week

Water storage tanks are cleaned atleast once in six months and as and when required in between. Water distribution system is regularly monitored and maintained by in-house maintenance staff. No persistent water leakage has been reported. The staffs are aware that leaking taps should be immediately replaced to avoid wastage of water. Minor leakages are sorted out immediately by the in-house plumber. College is equipped with water saving fixtures in taps wherever required and urinals tap automation.

**Rain water:**

Campus has rooftop rainwater collecting facility which collects rain water and stored in two tanks of 25,000 L capacity each.

**Drinking water:**

Reverse Osmosis purifying units are available to cater to the drinking water needs of students, staff and visitors on campus.. Sign boards are placed in prominent locations creating awareness on water conservation and its importance. Drip/sprinkler irrigation is adopted to water the garden/landscape. The college regularly conducts activities to spread awareness and educate the staff and students on water conservation activities. Drinking water is tested for compliance with the drinking water standards and found to be safe.

It is suggested to regularly test the RO water quality to ensure its potability. Also, reject water from RO unit could be directed to the garden area to be used to water plants and lawn

**Green chemistry initiatives in laboratories****▪ Microwave assisted synthesis**

Embracing sustainable practices in the synthesis of pharmaceutical compounds, Dept. of Pharmaceutical Chemistry has adopted microwave-assisted synthesis. For example, for the synthesis of Benzyle Acetate, traditionally involves hours of refluxing benzyle alcohol and acetic acid, consuming energy and time. However, alternative approached followed by the department involves mixing the components and subjecting them to microwave irradiation for a shorter period. This not only accelerates the esterification process but also reduces energy consumption, exemplifying their commitment to efficient and eco-friendly methodologies.

**▪ Ultrasonification:**

In the department, there is also practice of ultrasonification to prepare materials such as silver nanoparticles. Unlike the traditional method that employs chemical reducing agents, which can be resource intensive and multi-step, ultrasonification offers an eco-friendly alternative. By utilizing ultrasonic waves to promote reduction, a stream-lined process leading to rapid and green synthesis of nanoparticles is employed.

**▪ Usage of toxic fuming cupboards at UG/PG labs**

Ensuring safety of students and researchers, the college euse specialized toxic and fuming cupboards in labs. These facilities are designed to handle hazardous chemicals safely, preventing harmful fumes from escaping into the environment and providing a controlled



workplace for potentially risky experiments. Commitment to both safety and environmental responsibility is reflected in these measures.

- **Avoidance of toxic chemicals**

As part of green initiative, toxic chemicals are avoided wherever feasible. By selecting alternative reagents and methods that reduce or eliminate toxic waste, the college contributes to a healthier laboratory environment and minimize the ecological footprint. This conscientious approach align with the college’s dedication to responsible and sustainable research practices.

- **Safety training**

Knowledge and awareness are integral to safe lab practices. Safety training is an essential component of the green initiative. By imparting comprehensive safety to the students and researchers, the college ensures that they are equipped to handle materials responsibly, mitigate risks, and create culture of safety consciousness. Their commitment to safety underscore holistic approach to sustainability.

Incorporating these green initiatives, college in general and department of pharmaceutical chemistry in particular are actively advancing both environmentally responsible and safety-conscious practices in research and teaching. Through innovative methods, conscious material selection and a focus on safety, they contribute to a more sustainable future for pharmaceutical research and education.

**Table 1: Design water supply for domestic purposes for the campus of JSS College of Pharmacy, Ooty**

	<b>Number of persons</b>	<b>Water consumption Litres/person/day (Litres)</b>	<b>Total water consumption (Litres/day)</b>
Hostel	440	135	59,400.00
Institution (excluding hostelites)	704	45	31,680.00
<b>Total</b>			<b>91,080.00</b>

## **WASTEWATER MANAGEMENT**

Major sources of wastewater are toilets in academic areas, laboratories, canteen and hostels and laboratory wash basins. There is a provision of toilets for students and staff with special needs.

Wastewater generated in the campus is let into underground sewage network system of Ooty Municipal Corporation. Trade effluent generated from the laboratories and the animal house is

disinfected before letting into the sewer leading to the municipal sewage treatment plant. No leakages are reported in the wastewater collection pipelines.

There are 127 taps available in the laboratories of various departments. Considering average use of water of 5 L per tap for the laboratory purposes (example – sample preparation, distilled water preparation, reagent preparation, cleaning and washing glassware, etc.), total water consumption in laboratories is about 635 litres per day.

The total landscape area is 3.03 acres (12262 sq m) and considering 5 litres/sq m of water requirement, the total water required for gardening and landscaping is 61,310.00 litres per day. This quantity will reduce during the monsoon season and other rainy days. In all, about 1.54 Lakh litres of water is required per day. Considering 80% of water used turns out to be wastewater, institution generates about 1.23 lakh litres of wastewater per day. However, this is a rough estimate and excludes requirements for canteen/kitchen, water demand by visitors, guest house and other miscellaneous water usage.

## **ENERGY MANAGEMENT**

- Sources of energy: Electricity, and Diesel generators
- Number of diesel generators: 1 no. (diesel used is 3000 L in the Year 2020-21)
- Number of LED lights: 1235
- Number of T5: 340
- Number of CFL: 85
- Number of Fluorescent: 345
- Number of Solar lamps: 2
- Number of Computers: 138, operating on an average of 5 hours/day
- Printers: 56, operating on an average of 5 hours/day
- Number of Laptops: 13, operating on an average of 5 hours/day
- Number of LCD Projector: 20, operating on an average of 5 hours/day
- Number of Photocopiers: 03, operating on an average of 2 hours/day
- Number of Televisions: 34
- Major electrical equipment (such as hot air oven, Lift, Water Heater, Electrical Heat pumps, Water pumps(motors), refrigerators, etc)

Computers are set to power saving mode. Students and staff are instructed to switch off all electrical appliances when they are not in use.

## **SOLIDWASTE MANAGEMENT**

- Types of solid waste generated in campus: paper waste, laboratory waste, e-waste, garden waste, bio-degradable waste, damaged furniture.

Campus is plastic free. Approximately, 20 kg of solid waste, excluding food waste, is generated per day. Solid waste generated in campus is segregated at source; colour coded bins are placed at several locations in the premises.

Food waste generated, about 200 kg/week (2 hostels), is given away on a daily basis to piggery, free of cost. Paper and other non-biodegradable waste disposal is outsourced. Also, collection and disposal of e-waste is outsourced to a third party.

Students are instructed to follow the guidelines of waste management. Placards on waste management are displayed in the campus. Students are involved continuously in taking up projects and participating in awareness camps for segregating solid wastes across campus under NSS wing.

## **GREEN INITIATIVES**

- Garden area inside the college: 3.03 acres
- The trees and plants species present in the campus include Walnut, Plums, Peaches
- The percentage of green area, which includes any area which has grass cover, tree cover and horticulture (calculated using the following equation; MGNCRE, 2019) is 31%.

$$\text{The percentage of green area} = \frac{\text{Total green area in square meters}}{\text{Total area in square meters}} \times 100 \times 0.66$$

There is a medicinal garden on campus. Besides, there are large trees across the campus giving much needed greenery and fresh oxygen. Campus has several fruit yielding trees including Plums, Walnut, Peaches among others.

Special lecture programmes are organised by the college to create awareness about the nature. NSS and NCC Students are involved in Swachh Bharat Abhiyaan. Students are involved in sapling plantations, cleaning and watering the gardens. Several nature awareness programs have been conducted. Connecting with nature is key to understand human dependence on nature and the need



to preserve that precious resource. Environmental day is celebrated with active participation from students and staff.

## **CARBON FOOTPRINT**

- Number of persons using two wheelers: Students: ~75, Faculty: ~50, Visitors: ~10
- Number of persons using four wheelers: Faculty: ~30, Visitors: ~5
- College transport facility: 1 bus and 2 cars

## **STUDENT INVOLVEMENT IN ENVIRONMENTAL CONSERVATION ACTIVITIES**

The college has an active NSS student wing involving enthusiastically in various activities related to environmental conservation. Some of their activities include tank/reservoir cleaning campaign, sampling plantation, save water campaign, forest conservation, celebrations of environment day and forest day, plastic removal campaign among others. Details of these activities along with the pictures are presented in Appendices C4, C5 and C6.

## **OCCUPATIONAL HEALTH AND SAFETY**

It is noted that the institution gives prime importance to health and safety of their students and staff. Biohazard safety measures are implemented according to the protocol.

The safety measures for the Laboratories are given in the Practical manual to all the Students. The Signage boards on Dos and Dons in the Laboratories are placed at strategic points. Also it is mandatory to wear aprons, gloves, caps, shoes and mask during the practical hours as appropriate.

The students are involved and sensitized about the importance of laboratory safety. Whenever a new equipment is purchased, demonstration and mock drills are given to the potential users including students by the vendor and internal experts.

In order to improve health and safety, the students are advised by the college to follow the following instructions.

### **General Laboratory Protocols and Basic Rules/Safety Measures/Fire Safety**

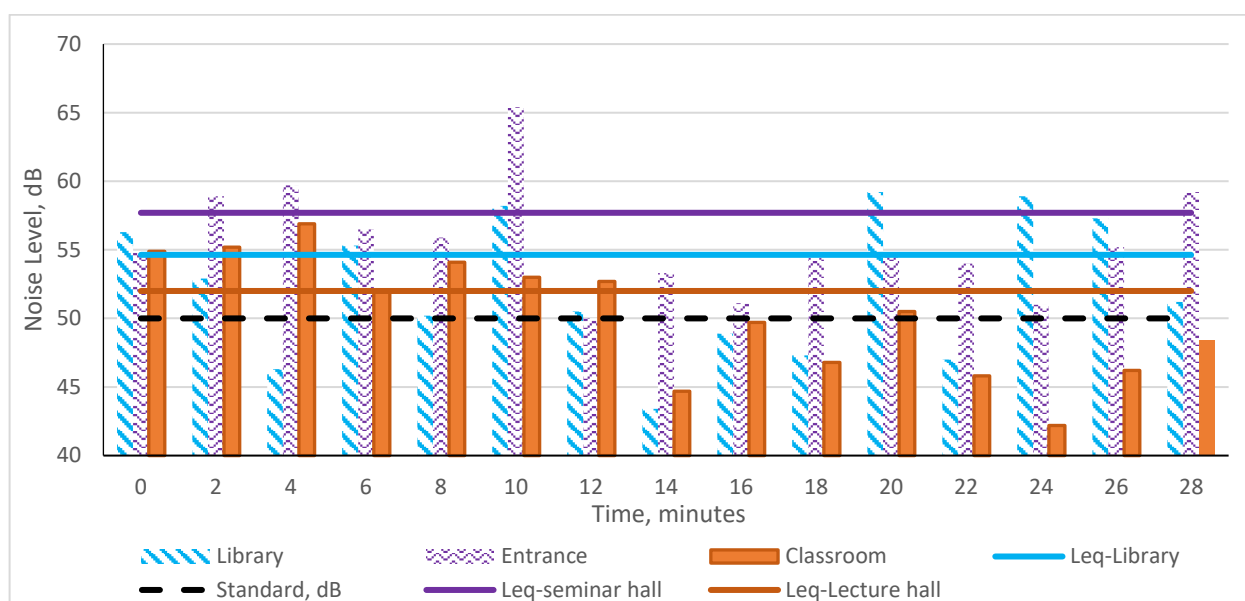
- a. Dos and Don'ts information is displayed at prominent places in each laboratory
- b. The laboratory manual includes general safety instructions

## **ENVIRONMENTAL MANAGEMENT PLAN**

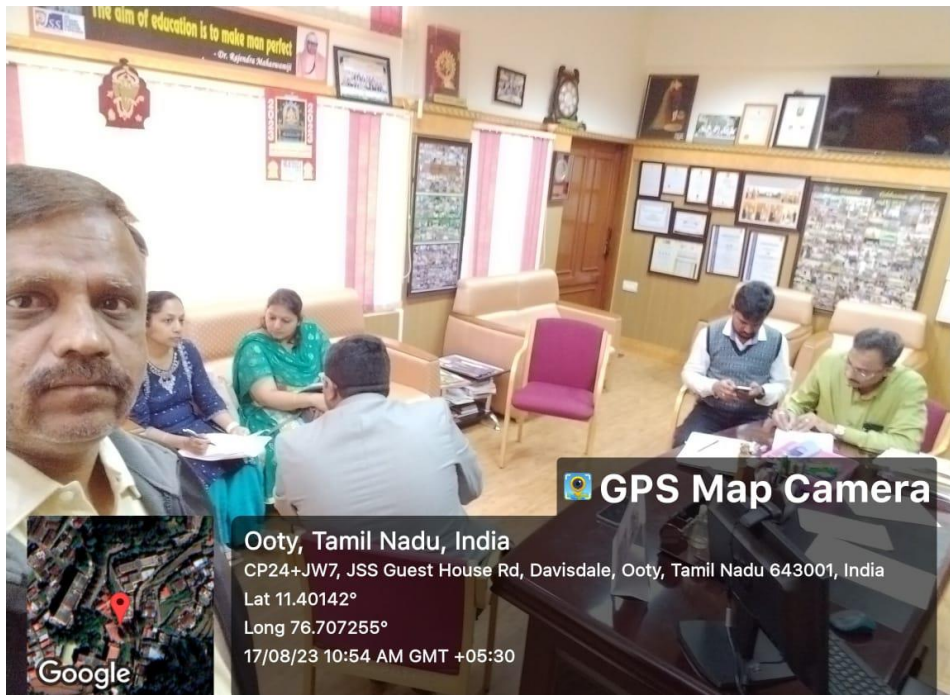
Approximately Rs 7,00,000 for Garden Maintenance per year

## ENVIRONMENTAL MONITORING

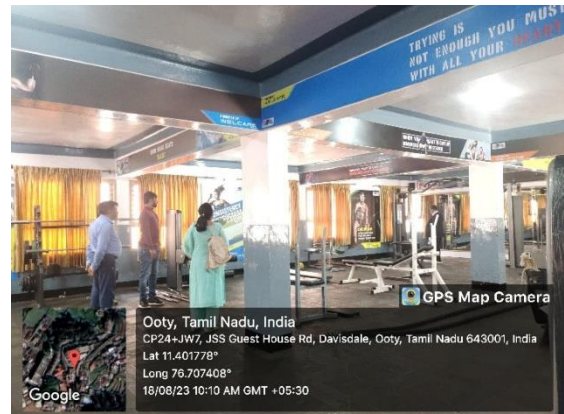
The audit team during their field visit, monitored ambient air quality, noise levels and light intensity levels at several locations within the campus (Appendix C7). Also collected drinking water samples, randomly from a few RO units within the campus for analysing the drinking water quality of these samples. Leq (equivalent continuous sound level - the steady sound level which over a given period of time has the same total energy as the fluctuating noise.) is found to be 54.5 dB, 57.7 dB and 52 dB in Library, Entrance lobby and Classroom, respectively (Figure 4). According to the Ambient Air Quality Standards with respect to noise, noise level (Leq) shall not exceed 50 dB during day time (6:00 am to 10:00 pm) for silence zone and 55 dB for residential areas. Silence zone is an area comprising not less than 100 m around hospitals, educational institutions, religious places or any other area which is declared as such by the competent authority.



**Figure 1: Noise levels measured in the campus of JSS College of Pharmacy**



**Audit team visit and discussion with the staff-in-charge at the Campus of JSS College of Pharmacy, Ooty**



**Audit team visit to the campus of JSS College of Pharmacy, Ooty**





**Audit team's exit meeting and discussion with the staff-in-charge at the Campus of JSS College of Pharmacy, Ooty**

## CERTIFICATE OF APPROVAL

Issued by Indian Register Quality Systems  
(A Division of IRCLASS Systems and Solutions Private Limited)

This is to certify that the Environmental Management Systems of

**Organisation:** JSS Academy of Higher Education & Research

**Address:** Site 5: JSS College of Pharmacy,  
Rocklands, Post Box No.20,  
Udhagamandalam - 643 001,  
Tamil Nadu State, India

has been assessed and found conforming to the following requirement

**Standard:** ISO 14001:2015

**Scope:** Providing Undergraduate and Post Graduate  
Education in Pharmacy

**Certificate No.:** IRQS/240300698/E

**Initial Certification Date:** 16/04/2024

**Current Date of Granting:** 16/04/2024

**Expiry Date:** 15/04/2027



**Shashi Nath Mishra**  
Head IRQS

This approval is subject to continued satisfactory maintenance of the Environmental Management Systems of the organization to the above standard which will be monitored by IRQS. The use of the Accreditation Mark indicates accreditation with respect to activities covered by the certificate with accreditation no. EM 005. Condition Overleaf CGA/IRQS/NABCS/EM/Rev 01

Head Office: 52A, Adi Shankaracharya Marg, Opp. Powai Lake, Powai, Mumbai - 400 072, India.

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Udhagamandalam - 643 001,  
Tamil Nadu State, India

has been assessed and found conforming to the following requirement

**Standard:** ISO 50001:2018

**Scope:** Providing Undergraduate and Post Graduate Education in Pharmacy

**Certificate No.:** IRQS/241000699- E

**Initial Certification Date:** 18/04/2024

**Current Date of Granting:** 18/04/2024

**Expiry Date:** 17/04/2027



**Shashi Nath Mishra**  
Head IRQS

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