

# Green Audit Report

## JSS College of Arts, Commerce and Science

Ooty Road, Mysuru -570 025, Karnataka, India

<https://www.jsscacs.edu.in/>



Prepared by



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JSS Technical Institutions Campus, Mysuru – 570 006



**December 2021**

JSS MAHAVIDYAPEETHA

JSS SCIENCE AND TECHNOLOGY UNIVERSITY

SRI JAYACHAMARAJENDRA COLLEGE OF ENGINEERING



**JSS**  
SCIENCE AND  
TECHNOLOGY  
UNIVERSITY  
MYSURU

- Constituent College of JSS Science and Technology University
- Approved by A.I.C.T.E
- Governed by the Grant-in-Aid Rules of Government of Karnataka
- Identified as lead institution for World Bank Assistance under TEQIP Scheme



Date: 30.12.2021

## DEPARTMENT OF ENVIRONMENTAL ENGINEERING

# CERTIFICATE

This is to certify that the Department of Environmental Engineering, JSS Science and Technology University, Mysuru has conducted detailed “Green Audit” of JSS College of Arts, Commerce and Science, Ooty Road, Mysuru for the year 2020-2021. This Green audit include assessment of planning, efforts and actions implemented by the College with respect to the management of water, wastewater, solid waste, energy, greenery, student involvement, etc. as well as providing suggestions on strategies that the College can follow to minimize its adverse impacts on the environment. In an opinion, our observations, and to the best of the information given to us, said green audit gives a true and fair view of the green initiatives for maintenance of eco-friendly campus.

### Green Audit Assessment Team

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## Preface

Institutional self-inquiry is a natural and necessary outgrowth of quality of higher education. Concern about environmental degradation and realization of values of the environment are logical consequences of research, teaching and learning process. In its pursuit for improving environmental quality and to maintain a pristine environment for the future generation of students, JSS College of Arts, Commerce and Science, Ooty Road, Mysuru has made a self-inquiry on environmental quality of the campus with the following objectives:

- To establish a baseline of existing environmental conditions with focus on natural and physical environment in the institution.
- To understand the current practices of sustainability in the institution with regards to - the use of water and energy –green environment – water and waste management – solid waste management, etc
- To promote environmental awareness in the institution through participatory auditing process
- To create a report that documents baseline data of good practices and provide future strategies and action plans towards improving environmental quality in the institution
- To encourage pro-active participation of students and staff of the institution in environmental awareness and sustainable development

This report is prepared by the green audit assessment team of the Department of Environmental Engineering, Sri Jayachamarajendra College of Engineering, JSS Science and Technology University, Mysuru. As there was no standard model for such an environment/green audit for colleges/institutes, the green audit team brainstormed and evolved a questionnaire survey to be filled by the institution (i.e. JSS College of Arts, Commerce and Science, Ooty Road, Mysuru) that will help in understanding the activities/initiatives taken up in the institution towards environmental conservation and sustainability. The audit team has made short term and long term suggestions to take environment protection to higher levels and it is hoped that this will receive due attention of the Institution authorities as well as all the stake-holders of the institution.

## Green Audit Assessment Team

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*Dr. Pushpa Tuppad, Associate Professor*  
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## Coordinating team of JSS College of Arts, Commerce and Science, Ooty Road, Mysuru

*Prof. H. C. Honnappa, Principal*  
*Dr. C. Mallikarjuna Swamy, Assistant Professor of Chemistry*  
*Dr. B.Y. Sathish Kumar, Assistant Professor of Biotechnology*

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# CHAPTER- 1

## 1. INTRODUCTION

### 1.1 GENERAL

Green audit is the process of assessing the environmental impact of an organization, process, project, product, etc. It involves systematic identification, quantification, recording, analysis and reporting of components of environmental diversity of various establishments. Green audit can be a useful tool for an institution to determine how and where they are using water, energy or other natural resources, how much wastewater and solid waste is being generated; the institution can then consider how to implement changes and make savings by protecting the environment. Green audit can create health consciousness and promote environmental awareness besides enhancing values and ethics in the educational institutions. It provides staff and students a better understanding of Green impact on and off campus. If self-assessment is a natural and necessary for quality education, it could also be stated that institutional assessment is a natural and necessary outgrowth of quality educational institution. Thus, it is imperative that the institutes become proactive in evaluating their own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. It is also necessary to conduct green audit in college campus because staff and students become aware of the green audit process and its advantages, understanding of which will certainly lead to actions and initiatives to save the planet. Nurturing our environment is one of the key characteristics of good citizens of our country. The aim of green audit is to help the institution to set environmental examples for the community and to educate the young learners.

The National Assessment and Accreditation Council (NAAC), New Delhi, which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. NAAC has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit report. Without NAAC accreditation, universities and colleges are not eligible for UGC grants, RUSA grants, financial aid, etc. Institutes with top NAAC grades such as 'A++', 'A+' and 'A' are most sought-after



institutes by students and employers alike, as they offer high-quality education. Green Audit is assigned to the Criteria 7 of NAAC.

### 1.2 STAGES OF GREEN AUDIT

#### **Pre-Audit:**

- Plan the audit
- Select the audit team
- Acquire the background information.
- Visit the site

#### **During Audit Process on Site:**

- Understand the scope of audit
- Verify/evaluate, both acquired information through questionnaire survey and onsite observations
- Prepare a report of the observations and recommendations

#### **Report Preparation:**

- Produce a draft report of the data collected and potential recommendations
- Produce a final report of the observations and the inference with accuracy
- Prepare an action plan to overcome the limitations/challenges
- Distribute the final report to the management
- Keep an internal watch on the action plan

### 1.3 BENEFITS OF GREEN AUDIT

There are many advantages of effective enforcement of green audit in the institutions/colleges. Green audit

- Helps to shield the environment with more efficient resource management.
- Recognizes the cost saving methods through waste minimization and proper management strategies.
- Points out prevailing and forthcoming complications.
- Authenticates conformity with the implemented laws.

- Empowers the organizations to frame better environmental performance.
- Enhances the alertness for environmental guidelines and duties.
- Imparts environmental education through systematic environmental management approach and improves environmental standards.
- Provides benchmarking for environmental protection initiatives.
- Assures financial savings through a reduction in resource use, development of ownership, personal and social responsibility for the College and its environment
- Results in enhancement of college profile.
- Develops environmental ethics and value systems in youngsters.

On this background it becomes essential to adopt Green Campus policies in the institutes leading to the overall sustainable development. Policies of this nature include the adoption of sustainable, more efficient technologies, rebate programs or education campaigns. Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use and conservation, promote personal action, reduce the institute's water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are water, energy, waste, green cover and carbon footprint.

### **1.4 ABOUT THE INSTITUTE:**

JSS College of Arts, Commerce and Science, Ooty Road, is established in 1964 under the aegis of JSS Mahavidyapeetha, Mysore. The college is situated on a sprawling 7.08 acres (Table 1) plot with a spacious building and a hostel in a picturesque surrounding at the foot of Chamundi Hills. The college is situated in a lush green campus and operating with rich facilities available from Ground to 4<sup>th</sup> Floor. It has excellent infrastructure facilities with well-equipped and spacious classrooms, multimedia facilities, a library, canteen and hostels for girls. The women's hostel has also been extended to accommodate 278 students.

The college is offering a total of 56 programmes, viz., B.Sc., B.A, B.Com., BCA, BBA, M.Sc. (Physics, Chemistry, Mathematics, Computer Science, Biotechnology, Biochemistry, Botany,

and Zoology), M.Com., MA (English, Kannada), Master of Social Work, MCA and Ph.D., COCs and PG Diploma programmes are also offered.

The College was started as an affiliated college of University of Mysore with undergraduate programmes in B.A, BSc, B.Com, BBM and was given permanent affiliation in 1993. The College is recognised by UGC under section 2(f) and 12(B) of the UGC Act 1956 and is receiving central assistance. The college has been functioning as an autonomous college from the academic year 2005-06. The distinctive features of autonomy are that the college is empowered to frame the syllabi, introduce new courses and conduct examinations independently. The degree is awarded by the University of Mysore.

Campus is wi-fi enabled. College is renowned for the outstanding holistic education with a strong focus on student academic progress and achievements.

### **Vision:**

To be known as an institution providing need-based, skill-integrated, cost- effective, quality and holistic education, transforming the students into globally competitive, employable and responsible citizens and to be recognized as a centre of excellence.

### **Mission:**

- To create and acquire relevant knowledge along with skills and global competencies and disseminate the same among students.
- To provide holistic education through relevant curricula, programmes and pedagogic innovations focusing on employability and self-employment.
- To undertake research work contributing to the creation of knowledge, skills and its applications for sustainable development.
- To establish linkage and collaborations for the betterment of teaching, learning, research and extension
- To provide good infrastructure, human resource and necessary support-services for the betterment of students' progress and welfare.
- To promote national integration, human rights, universal brotherhood and community development activities through inclusive practices.

### **Internal Quality Assurance Cell (IQAC)**

Quality enhancement is a continuous process. The internal quality assurance cell (IQAC) will become a vital part of the institution's quality assurance system and work towards ensuring quality enhancement and sustenance. The prime task of the IQAC is to act as a catalyst and develop a system for conscious and consistent improvement in the overall performance of its institution. For this, during the post-accreditation period, institutions need to channelize their efforts towards promoting holistic academic excellence including the implementation of the peer team's recommendations. The establishment of the IQAC is the first step towards institutionalization and internalization of quality enhancement initiatives. Its success depends on its sense of belongingness and participation in all the activities of the institution. It is aimed that the IQAC has to play pivotal role in each and all aspect of higher education institutions. Thus, IQAC was established in JSS College in the year 2003 with the vision to promote quality culture as the prime concern.

IQAC will take necessary measures in JSS College to organize various quality improvement programmes for better teaching and learning processes. In the year 2020-21 the teachers have been assisted financially to participate in various professional development activities in and outside the college. Besides, several online and offline activities have been conducted for the benefit of students, teachers and non-teaching staff. Some of the programmes are Skill development and Entrepreneurship, IPR, Research Methodology, Best practices in Online teaching, Orientation and retraining programmes, administrative training programmes etc. IQAC is contributing constantly for betterment of environment in the college premise by creating awareness on various aspects such as energy saving, non-usage of plastic, generating little or no waste in labs etc. IQAC has the practice of preparing the action plan for Green audit, energy audit and to maintain sustainable environment in the premises.

#### **Accreditation:**

The college has undergone assessment & accreditation by NAAC and accredited with four Star grade in 2001, re-accredited with 'A' grade in 2008 (CGPA 3.03, cycle 2), 2014 (CGPA 3.04, cycle 3) and 2019 (CGPA 3.21, cycle 4). In 2010, the College was recognized by UGC as 'College with Potential for Excellence' and continued for II phase in 2015. Further, UGC-DDU KAUSHAL Kendra was established with financial assistance from UGC. The KAUSHAL

Kendra is offering B.Voc./M.Voc. in Food Processing & Engineering, B.Voc./M.Voc. in Software Development, Certificate, Diploma and Advanced Diploma courses in Animation & Multimedia under Community College Scheme.

**Table 1: Area coverage of the college**

Type	Area, acres (m <sup>2</sup> )
Campus area	7.08(28,651.74)
Total plinth area of buildings	4.28(17,320.55)
Total green cover	2.8 (11,331.2)

## 1.5 NAAC GRADING IN ASSESSMENTS

With the privatization, widespread expansion, increased autonomy and introduction of Programmes in new and emerging areas have improved access to higher education in several institutes and colleges. This has also led to widespread concern on the quality and relevance of the higher education. To address these concerns, the National Policy on Education (NPE, 1986) and the Programme of Action (PoA, 1992) spelt out strategic plans for the policies, advocated the establishment of NAAC. The mandate of NAAC as reflected in its vision statement is in making quality assurance an integral part of the functioning of Higher Education Institutions (HEIs).

## 1.6 CAMPUS INFRASTRUCTURE

### Library

The library at JSS College of Arts, Commerce and Science serves the information needs of faculty and students. The library has carpet area of 14,400 sq ft and it is spread over two floors with the ground floor and first floor having seating capacity of 100 and 200 persons, respectively. There is subscription to E-Journals through Inlibnet with N-list memberships for students and staff. Library also has subscription to subject journals and general magazines.

### Athletics & Fitness

The campus has multi-gym and both Indoor and Outdoor sport facilities for fitness including concrete basketball court with Acrylic Boards, separate courts for Volleyball, Ball badminton, throw ball, Badminton (outdoor) and Tennicoit, table tennis, etc.

### Arts and Culture

The college proudly promotes cultural programmes to foster a distinctive identity of their own and to sensitize towards our rich cultural inheritance.

### NSS and NCC

**NSS** - The National Service Scheme (NSS) is an Indian government sponsored public service programme conducted by the Ministry of youth affairs and Sports of the government of India. Popularly known as NSS, the scheme was launched in Gandhiji's centenary year in 1969. Aimed at developing student's personality through community service, NSS is a voluntary association of young people in colleges. So, with the objective to provide social service, our college established NSS unit in the year 1964.

The programme aims to instill the idea of social welfare in students, and to provide service to society without bias. NSS volunteers work to ensure that everyone who is needy gets help to enhance their standard of living and lead a life of dignity. In doing so, volunteers learn from people in villages how to lead a good life despite a scarcity of resources. It also provides help in natural and man-made disaster by providing food, clothing and first aid to the disaster's victims. With the plan of Regular Activities (120 hours) and Annual Special Camp (120 hours), all the NSS Volunteers will serve through the institute various activities and will be owning recognitions and awards. Some of the activities are Cleaning, Afforestation, Stage shows or a procession creating awareness of such issues as social problems, education and cleanliness, Awareness Rallies, Inviting doctors for health camps etc.

JSS College is very significantly recognized with its own objectives in NSS and it is at constant support to the unit to serve the society to a maximum extent. To mention a few of activities undertaken by NSS unit of JSS are, cleaning of rivers, shramadan, village camps, etc. NSS has adopted the villages namely, Gaddige, Kuttavadi, Mantihalli, Basavanahalli, etc. and undertaken the activities like organizing awareness programme on Cleanliness, COVID-19 measures, supporting Govt. Schools with computer, printer and other facilities etc. Under Unnath Bharath Abhiyan Scheme of UGC, the college has adopted villages namely Mallarajaiana Hundi, Hadinaru, Hadinaru Mole to undertake social awareness programmes.

**NCC-** The NCC Company 2/14 KAR BN NCC of JSS College of Arts, Commerce & Science., Mysore -25 was established in the year 1966 and strength of the company is 160 includes SD and SW. The company celebrated silver jubilee function during the year 1991-92. Since the beginning the company is training the cadets in a disciplined manner and contributing to the National unity and integrity through inculcation of NCC ideals.

In the beginning Major B. V. Shambashivaiah, Presently Chief executive of the College was looking after the NCC, later Major M. Mahadevappa, Present Principal of the JSS College, Nanjanagudu, Capt. H.S. Nagendra Kumar were looking after the NCC. From 2015 onwards, Lt. Dr. L. Vinaykumar, Department of Physics, Associate NCC officer is looking after the company in the college.

One of the important achievements of the company is that since 2011 cadets are continuously attending RD Parade in Delhi. Shashank B (2021), and Prajwal and Chaithra S (2022) from NCC of the college have participated in PM Rally and RD Parade at Delhi.

NCC has adopted community development activities with the aim of imbibing among the cadets selfless service to the community, dignity of labour importance of self-help, need to protect the environment and to assist weaker sections of the society in their upliftment. This was envisaged through programmes involving in Adult-education, Tree plantation, Blood donation, Anti-Dowry Rally, Anti-Female Infanticide Pledge, Anti-Leprosy Drive, AIDS Awareness Rally, Visit to Old Age Homes, Slum clearance, Disaster Management & Relief, Village upliftment and various other social schemes.

## CHAPTER -2

### 2.1 METHODOLOGY OF GREEN AUDITING:

Green audit is a management system tool used methodologically for the protection and conservation of environment and sustainable development. It can be adopted by any industry, organization, and institute and even by housing complex. The green audit is useful to detect and monitor sources of environment pollution and it emphasizes on management of all types of wastes, monitoring of energy consumption, monitoring of quality and quantity of water, monitoring of hazards, safety of stakeholders and the management of disasters (Patil et al., 2019).

The methodology includes three stages: pre-audit, audit and post audit. Pre-audit mainly included obtaining response to the questionnaire survey. Audit stage included review of the responses received through physical inspection of the campus, observations, discussion with the concerned authorities of the Institution. Post audit stage included data analysis and interpretation and proposing recommendations.

### 2.2 PRE-AUDIT STAGE:

A pre-audit meeting is important to establish the scope and objectives of the audit and the practicalities associated with the audit. As a first step of audit process, preliminary information with respect to initiatives/activities concerning green audit was collected through a questionnaire survey. This questionnaire was categorized into various sections including general information, water management, wastewater management, energy management, solid waste management, green initiatives, carbon footprint, and occupational health and safety.

### 2.3 AUDIT STAGE

After the response was received for the questionnaire from the college (also referred to as auditee), a visit to the auditee's campus was scheduled. In this regard, the green audit assessment team (referred to as auditing team: Dr. Pushpa Tuppad, Mrs. Thanushree M. S., Mrs. Sahana M., and Dr. Vishistta Nagaraj, Department of Environmental Engineering, Sri Jayachamarajendra



College of Engineering, JSS Science and Technology University) visited the campus of JSS College of Arts, Commerce and Science, Ooty Road, Mysuru.

The team met the Principal, Prof. H. C. Honnappa. Actual planning of audit processes and all pertinent sectors were discussed with the Principal and staff-in-charge. Necessary records/documents were collected and verified to clarify the data received through survey and discussions. After the preliminary discussion, the audit team visited the departments, laboratories, solar panels on the roof top, garden/landscape areas, composting units, hostel, etc., for visual observations and verification. Clarifications were sought over phone to collect additional information, wherever applicable. The information on student involvement with respect to green campus activities was collected from the staff in-charge.

### **Exit Meeting**

Discussions were made with the Prof. B. V. Sambashivaiah, Chief Executive, Prof. H. C. Honnappa, Principal and Dr. Rajendraprasad, IQAC Coordinator regarding their policies and future plans on environmental management. Green audit assessment team members suggested several measures which will further improve the institution in terms of green campus strategies.

### **2.4 POST AUDIT STAGE:**

Information collected was analysed and interpreted. A comprehensive green audit report was prepared and submitted to the college. On the basis of results of data analysis and observations, measures towards water conservation, wastewater management, solid waste management, energy conservation and health and safety concerns were recommended.

### **2.5 COMMITMENT OF THE COLLEGE MANAGEMENT**

The management of the college has been pro-active in their commitment towards green auditing. They have been encouraging all green activities and willing to support more of such activities towards safeguarding Mother Nature, including awareness programs on the environmental conservation, planting trees on and off the campus, comprehensive rainwater harvesting system, effective wastewater management, solid waste management, etc. The college looks into minutes problems related solid waste by providing separate facilities for leaf litter, kitchen waste and food waste management.

## CHAPTER- 3

### 3.1 STAFF INVOLVED IN GREEN AUDITING:

Following staff of JSS College of Arts, Commerce and Science (Autonomous), Ooty Road, Mysuru were involved in Green Auditing under the general supervision of Prof. H. C. Honnappa, Principal of the college.

#### Teaching Staff:

*Prof. H. C. Honnappa, Principal*

*Dr. C. MallikarjunaSwamy, Assistant Professor of Chemistry*

*Dr. B.Y.Sathish Kumar, Assistant Professor of Biotechnology*

#### Non -Teaching Staff:

*Mr.Chandru S., Typist*

*Mr. C. Mahesha, Assistant Administrative Officer*

### 3.2 KEY FINDINGS AND OBSERVATIONS

#### 3.2.1 WATER

- Main uses of water in the campus: Drinking, Laboratory, Canteen, Garden, Cleaning, Toilets, Bathrooms, Hostel, Washing, Office uses.
- Sources of water: Borewell (50% of total usage) and corporation
- Number of borewells: 03
- Borewell: 450ft deep
- No. of motors used for pumping: 06 (5HP, 3HP and 2 HP – 2 each)
- Water storage: Sump and Overhead tank - OHT(03 numbers with 50 KL capacity each, and one of 20 KL capacity)
- Approximate quantity of water pumped per day from sump to OHT is 75 KL
- Groundwater recharge pits: 03
- Number of water taps in staff rooms, common areas and hostels:280
- Number of water taps and usage in canteen: 08
- Number of water taps in laboratories:140

- Number of water coolers: 06 (50 LPH)
- Number of RO units: 01 (centralized 1000L capacity)
- Number of toilets in staff rooms, common areas and hostels: 36
- Water used for gardening/landscape:  $\approx$  8,000 L/d
- Quantity of water used to water the playground:  $\approx$  8000 L/d
- Total quantity of water used in hostel: 50,000 L/d
- Landscape is watered using borewell water once in two days/as needed in non-summer days and every day in summer

Water storage tanks are cleaned once in three month. 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.

### **Rain water:**

Campus has rooftop rainwater collecting facility which collects rain water directed to one of the three recharge pits established in the landscaped area.

A centralized RO unit is available which distributes treated RO water through a pipe network. It is suggested to regularly test the RO water quality to ensure its potability and reject water from RO unit to the garden area which can be used to water plants and lawn. 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. There are water level controllers for borewells and sumps. The college regularly conducts activities to spread awareness and educate the staff and students on water conservation activities.

### **Green chemistry initiatives in laboratories**

Green chemistry is the design of chemical products and processes that reduce or eliminate the generation of hazardous substances. As the steps are being strongly put in initiating Greener approaches, the laboratories are strongly in need of adopting some principles to protect environment from hazards. Therefore, in the laboratories of chemistry, biochemistry,

biotechnology departments, the reactions or processes are planned in such a way that very minimal waste is produced.

**Measures taken include:**

- The amount of materials needed will be used based on appropriate stoichiometric calculations.
- The reagents, solvents and other materials are chosen among the less toxic and safer groups.
- It is essentially planned to use less energy in performing the reactions. In most of the cases ambient conditions is predominately followed.
- The practice of using renewable materials and catalysts has also been made.
- All measures have been taken to avoid accidents, to prevent the generation of too much of waste, and taking actions to prevent pollution of surrounding atmosphere.

**Table 2: Design water supply for domestic purposes for the campus of JSS College, Ooty Road**

	<b>Number of persons</b>	<b>Water consumption Litres/person/day (Litres)</b>	<b>Total water consumption (Litres/day)</b>
Hostel	278	135	37,530.00
Institution	3351	45	1,50,795.00
Total			1,88,325.00

There are 140 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 700 litres per day.

The total landscape areas is 2.8 acres (11331.2 sq m) and considering 5 litres/sq m of water requirement, the total water required for gardening and landscaping is 56,650.00 litres per day. This quantity will reduce during the monsoon season and other rainy days. In all, about 2,45,675.00 litres of water is required per day. Considering 80% of water used turns out to be wastewater, institution generates about 2.0 lakh litres of wastewater per day.

### **3.2.2 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 Mysore City Corporation. No pre-treatment is provided for the wastewater generated in the laboratories. No leakages are reported in the wastewater collection pipelines.

### **3.2.3 ENERGY**

- Sources of energy: Electricity, Solar and Diesel generators
- Number of diesel generators: 3 no. (diesel used is 300 L in the Year 2020-21)
- Number of LED lights: 478
- Number of Solar lamps: 0
- Incandescent bulbs: NIL
- Number of fans: 407
- Number of Air conditioners: 20
- Number of Computers and printers: 485, operating on an average of 5 hours/day
- Number of Photocopiers: 06, operating on an average of 2 hours/day
- Number of Televisions: 03
- Major electrical equipment (such as hot air oven, muffle furnace, refrigerators, etc): 20

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

### **Roof top solar panels**

The college has installed 180kW rooftop solar power which is used to feed the Campus load and export the remaining energy to Chamundeshwari Electricity Supply Corporation Limited, Mysuru. In the last 12 months (Jan 2021 to Dec 2021) the college has exported 91972.5 kWh of power generated from solar grid.

### **3.2.4 SOLIDWASTE MANAGEMENT**

- Types of solid waste generated in campus: paper waste, laboratory waste, e-waste, garden waste, bio-degradable waste, damaged furniture.
- Number of collection bins: 20

**Table 3: Summary of solid waste generation in the campus**

Sl. No.	Source	Non-biodegradable (dry)	Biodegradable (wet)	Chemical
1	Office	0.5 kg/d	1.0 kg/d	-
2	Laboratories	0.5 kg/d	1.0 kg/d	150g/d
3	Canteen	0.5 kg/d	20.0 kg/d	-
4	Garden	0.75 kg/d	22.0 kg/d	150g/d

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. A functional compost unit (appendix-2) exists to treat leaf litter. Food waste generated, about 25 kg/week, 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.

### 3.2.5 GREEN INITIATIVES

- Garden area inside the college: 2.8 acres
- The trees and plants species present in the campus include Acoru scalamus, colocasia esculenta, Bambusa textilis, Alternanthera sessilis, Bryophyllum sp. Michelia champaca, Jasminum grandiflorum, Saracaasoca, Tamarindus indica etc. and other fruit yielding trees including pomegranate, tamarind, etc.
- 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 26%.

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

Scientific names of the plants and trees are displayed for the purpose of education and awareness. There is a medicinal garden (aptly called as “Ayurveda” – Appendix 4) on campus. Besides, there are large trees across the campus giving much needed greenery and fresh oxygen. Compost produced in-house is used for the garden/landscape and no chemical fertilizer and pesticides are used for vegetation within the campus. 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.

### 3.2.6 CARBON FOOTPRINT

- Number of persons using cycles: ~70
- Number of persons using two wheelers: Faculty: ~50, Visitors: ~10
- Number of persons using four wheelers: Students: ~200, Faculty: ~80, Visitors: ~100
- Number of persons using public transport for commuting to Institute: ~ 70%
- Number of persons using institutional transport facility: Nil

### 3.2.7 OCCUPATIONAL HEALTH AND SAFETY

It is noted that the institution gives prime importance to health and safety of their students and staff. 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
- c. Safety drills and first aid protocols to be followed in case of emergency are provided to students and staff
- d. Handouts are displayed in each floor and in laboratories
- e. Safety drills are conducted for students explaining the measures, precautions and responsibility to be exercised during fire hazards

**3.2.8 ENVIRONMENTAL MANAGEMENT PLAN**

- a. Time management to accommodate environmental management initiatives under NSS programs
- b. Annual expenditure incurred for Environmental Management Plan for the institution is Rs. 95,000.

**3.3 BEST PRACTICES**

Green audit assessment team takes this opportunity to appreciate the efforts/initiatives taken by JSS College of Arts, Commerce and Science, Ooty Road, Mysuru 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 1 to 7) of this report.

**3.4 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 Arts, Commerce and Science, Ooty Road, Mysuru, Karnataka, 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-7.

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

In the campus of 3629 people (students and staff) including 278 hostel inmates, approximately 2.0 lakhs litres of wastewater per day is generated. At present, the wastewater is let into Mysore City Corporation sewer line. 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.

### 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.

## 3.5 CRITERIA WISE RECOMMENDATIONS

### 3.5.1 WATER

- Leakages from taps and tanks should be reported and attended immediately. At the time of replacement, replace the existing taps with water saving taps.

- Install display boards to control over exploitation of water and save water.
- Water the garden judiciously.
- Have dedicated staff for water inspection and maintenance.
- 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.
- Take up renovation of traditional and other water bodies/tanks.
- Measure the amount of groundwater drawn from borewells and regularly monitor the water quality.
- Conduct more programs/workshops on water conservation at regular interval and ensure active participation of students and staff.

### 3.5.2 ENERGY

- 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.

### 3.5.3 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.

### **3.5.4 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
- Plant indigenous variety and less water requiring 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.
- Strengthen the registry of flora on campus
- 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
- Sustain the existing herbal/medicinal garden to improve awareness of Indian traditional house remedies for common ailments.

### **3.5.5 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.

- Discourage the students using two wheelers for their commutation.
- More use of generators every day should be discouraged.

### **3.5.6 CAMPUS SAFETY**

- Fire safety drill is conducted for all faculty and staff

### **3.6 EXIT MEETING**

Site visit by the audit team was concluded by the exit meeting. General and some specific feedback were given 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.

## Acknowledgements

*The Audit team from the Department of Environmental Engineering, Sri Jayachamarajendra College of Engineering, JSS Science and Technology University, Mysuru is thankful to the Principal and his team at JSS College of Arts, Commerce and Science, Ooty Road, Mysuru for entrusting Green audit services with us. The audit team whole heartedly acknowledges the hospitality, coordination and cooperation provided by the authorities and support staff of JSS College of Arts, Commerce and Science, Ooty Road, Mysuru.*

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# Appendix – 1

Photographs of the general observations regarding water conservation initiatives at JSS college of Arts, Commerce and Science, Ooty Road, Mysuru.



## Appendix – 2

Photographs of the solid waste management at JSS College of Arts, Commerce and Science, Ooty Road, Mysuru.





## Appendix – 3

Photographs of the energy conservation and harnessing of solar energy initiatives at JSS College of Arts, Commerce and Science, Ooty Road, Mysuru.





## Appendix – 4

Photographs of the green cover at JSS College of Arts, Commerce and Science, Ooty Road, Mysuru





## Appendix – 5

Activities by NCC wing at JSS College of Arts, Commerce and Science, Ooty Road, Mysuru



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## Appendix – 6

Activities by NSS wing at JSS College of Arts, Commerce and Science, Ooty Road, Mysuru



Cleaning River



Plantation Programme



Village Cleaning



**Women Empowerment Programme in Village**



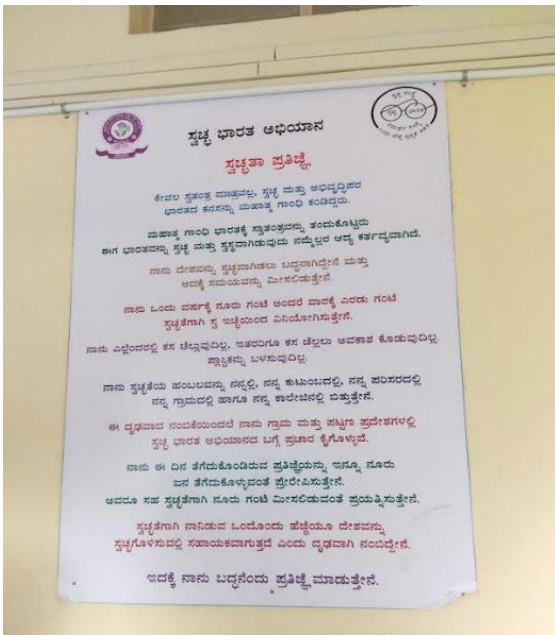
**Cleaning Bandipalyam Market**

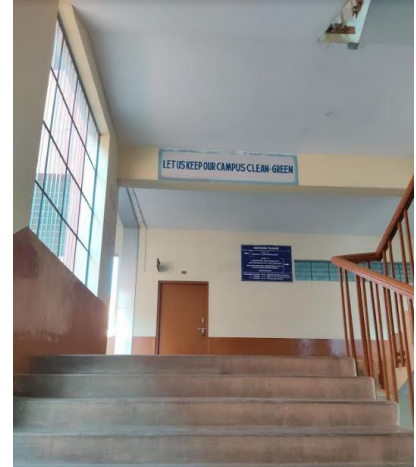
## Appendix – 7

Safety measures (laboratories and campus, in general), conservation awareness placards in campus and the Audit team visit to the campus of JSS College of Arts, Commerce and Science, Ooty Road, Mysuru









Audit team with the students and faculty of JSS College of Arts, Commerce and Science, Ooty Road, Mysuru