



Environmental Audit Report

Shivaji College

University of Delhi

Raja Garden, Ring Road, New Delhi- 110027



July 2021

Prepared By:

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Environmental Audit Report of Shivaji College, New Delhi has been prepared by STEP based on review of findings of internal environmental & green audits conducted by College, desktop review of documents/ records, virtual tour of the College campus and telephonic interviews of faculty, non-teaching staff & students. As a part of Environmental Audit, Shivaji College monitored light intensity & noise levels.

The audit was conducted in **June 2021**.

The Environmental Audit Report presents overall environmental status and initiatives taken up by the College to improve environmental conditions. The report also provides suggestions and recommendations to improve environmental sustainability.

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1. Introduction

Shivaji College (College), New Delhi was established in 1961 in Matiala by Hon'ble Dr. Panjabrao Deshmukh and shifted to present campus in 1976. College has more than 3700 students enrolled in various Academic, Professional and Research Programs. It is affiliated to University of Delhi. It has 195 faculty members and 110 non-teaching & other staff.

The College comprises 16 departments offering 20 undergraduate programmes. College offers various courses listed below:

Undergraduate Courses

B.Com (Hons.)
B.Com (Programme)
B.A. (Hons.) Business Economics
B.A. (Hons.) English
B.A. (Hons.) History
B.A. (Hons.) Hindi
B.A. (Hons.) Political Science
B.A. (Hons.) Sanskrit
B.A. (Hons.) Economics
B.A. (Hons.) Geography
B.A. (Programme)
BSc. (Hons.) Mathematics
BSc. (Hons.) Botany
BSc. (Hons.) Biochemistry
BSc. (Hons.) Physics
BSc. (Hons.) Chemistry
BSc. (Hons.) Zoology
BSc. Physical Science (with Chemistry)
BSc. Physical Science (with Computer Science)
B.Sc. Life Science

Postgraduate Courses

M.A. Hindi
M.A. Political Science
M.A. Sanskrit

Self-financing courses

B.A. (Hons.) Business Economics

Remedial Classes

Computer Skills and Information Technology
English/Communication Skills
Mathematical Ability (Basics)

ADD-ON Course

Certificate course of University of Delhi in German Language
Certificate course of University of Delhi in French Language
Certificate Course in Awareness on Legal Prospects

1.1 Environmental Setting

The college is spread over 10.35 acres which includes about 5 acre sports ground and 1.83 acre green area. College is easily accessible by road and metro; nearest metro station is ESI- Basaidarapur which is 900 m away. Indira Gandhi International Airport is 21.4 km away from the College.

Although campus is located in residential area, presence of green belt including gardens, lawns and an herbal garden has considerably reduced noise pollution in the campus. College building area has an academic building, an under-construction block and green operations/ infrastructures within the campus including roof-top solar PV system, Rainwater Harvesting System (RWH) and vermicomposting unit. For the treatment of sanitary wastewater generated in the campus, College is constructing Sewage Treatment Plant (STP) in the College building area.



Shivaji College Campus Location

1.2 Basis of Environmental Audit and Stakeholders Consultation

Environmental Audit enables to:

- Prepare environment management plan based on the intrusive studies performed
- Promote sustainability through efficient resource management resulting in cost reduction
- Develop outreach programs to enhance environmental awareness and sustainability

STEP Private Limited (STEP) team conducted Environmental Audit of Shivaji College in June 2021 through desktop review of findings of internal environmental & green audits conducted by College, review of documents/ records and virtual tour of the College campus and telephonic interviews of faculty, non-teaching staff and students.

Environmental audit emphasizes wastewater management, water conservation facilities, solid waste management, energy conservation measures etc. Prior to audit, questionnaire and checklists were prepared. Virtual tour of the campus included College building and infrastructure facilities such as solar PV system, Rainwater Harvesting System (RWH), Reverse Osmosis (RO) system, gardens etc. List of stakeholders interviewed is presented in **Annexure 1**.

The Environmental Audit Report presents overall environmental status and initiatives taken up by the institution to improve environmental conditions. The report also provides suggestions and recommendations to improve environmental sustainability.

1.3 Campus Information

College campus consists of two buildings, one is operational and another is under construction. As the under- construction building is non-operational, it is not considered in the Environmental Audit Scope.

College building has classrooms, well-equipped laboratories, a library and an auditorium. College sports ground has indoor and outdoor games facilities. There are 4 gardens in the campus including an herbal garden. The area details of the College building is presented in **Table 1**.

Table 1: Facilities Details

Floor	Facilities
Ground floor	2 Chemistry laboratories, computer laboratories, 5 classrooms, 2 small classrooms, canteen, girls common room, Principal's office, staff room, administrative office, bank, 2 washrooms
First floor	2 Physics laboratories, 2 computer laboratories, staff room, 10 classrooms, auditorium, 2 washrooms
Second floor	Library, 10 classrooms, zoology laboratory, 2 botany laboratories, lecture theatre, 2 washrooms
Third floor	Library, pantry, staff room, biochemistry laboratory, 5 classrooms, lecture theatre, 2 washrooms
Terrace	Solar Panels

2. Environmental Audit

For Environmental Audit following major areas (including their subsections) were covered and compliance/ initiatives under these areas were verified/ validated.

- a) Water Efficiency
- b) Wastewater Management
- c) Solid Waste Management
- d) E- Waste Management
- e) Energy Efficiency
- f) Emissions
- g) Indoor Air Quality
- h) Light and Acoustics
- i) Environmental and Sustainability Initiatives

The light intensity and noise levels were measured at different locations within the campus by the College for Audit purpose.

3. Environmental Audit Observations and Recommendations

3.1 Water Efficiency Observations:

Observations:

- a) Major water source for College is tap water, supplied by Delhi Jal Board. College also has one borewell in the campus which is currently not used for water withdrawal. As informed by College's water management team, daily water consumption for the entire campus when in operation is 51 KL, which includes 25 KL consumption in academic area and 26 KL for gardening. Water collected in rainwater harvesting pits is used for gardening. Water consumption of the College works out to be 6.3 L/person/day. As per IS 1172 standards (http://dasta.in/wp-content/uploads/2015/04/CB_Code_2002.pdf) for non-residential institutions, water consumption should be maximum 45 L/person/day. Thus, water consumption is well under limit.
- b) As per the water bill dated 15.06.2021 available for review, water consumption from November 2020 to June 2021 varies between 78 KL/ month to 244 KL/ month, because college is non-functioning/ partially functioning as per COVID- 19 regulations imposed by Delhi Government.
- c) Water is stored in the underground storage tank of capacity 40 KL, and then is transferred to 12 overhead tanks of total capacity 21 KL using 5HP pump and later distributed to washrooms, basins, kitchens, laboratories and water purifiers/ coolers installed in the College building. Water purifiers are based on Reverse Osmosis Technology (RO) and fitted with coolers. Additionally, 2 tanks of 5 KL capacity each are installed in the campus to provide inlet water to 1 KL/ day RO system. Water from RO is sent to drinking water unit provided near main gate. The water distribution diagram is presented in **Figure 1**. Third party contractors are appointed by College for the maintenance of RO system and water purifiers.

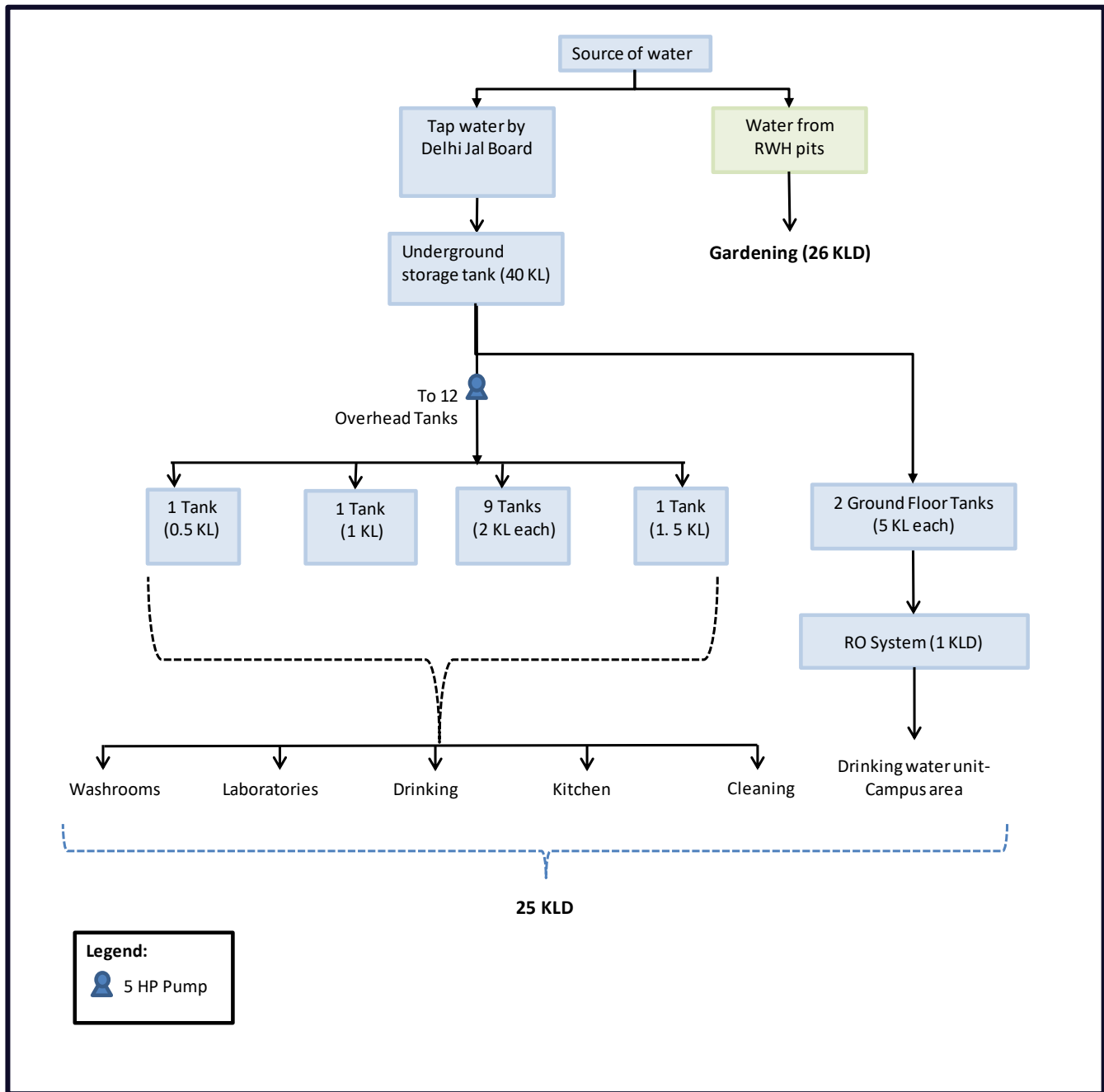


Figure 1. Water Distribution Diagram

- d) Rainwater Harvesting System- RWH system is comprised of rooftop and surface runoff. Through RWH, rain water collected is used for recharging ground water through 2 recharge bores. Rain water collected is also stored in recharge pits which is used for gardening. Installation of rooftop RWH system is also planned for under-construction building which will comprised an underground tank with a desilting chamber of 60 KL storage capacity.
- e) Water conservation faucets (non-concussive taps, aerator taps) are fitted in some washrooms.
- f) Dry and wet mopping is practiced for floor cleaning.
- g) As informed, tap water leakage is immediately attended to by the maintenance department.
- h) Sprinkler system is provided in all gardens which leads to water conservation.
- i) Signage on water conservation is not seen in washrooms or near water purifiers.



Rainwater Harvesting Pits



RO system

Recommendations:

- Drinking water quality shall be as per IS:10500 (<http://cgwb.gov.in/Documents/WQ-standards.pdf>).
- College should test water quality at regular intervals, develop water demand/ balance diagram and a plan delineating water conservation practice.
- Water consumption can be reduced through various conservation methods. Replacement of all old water faucets with water saving faucets such as pressmatic taps, aerator taps, jet sprays etc. can save water and help in minimising the water footprint.
- Records of water leakage complaints should be maintained as a part of Standard Operating Procedures (SOPs).
- Signage/ posters emphasizing water conservation should be posted in high water consumption areas such as kitchen, washrooms, drinking water area etc.

3.2 Wastewater Generation and Management

Observations:

- Wastewater is mainly generated from washing, toilet flushing, canteen kitchen and laboratories. Total 8 washrooms are provided in the College building (2 washrooms on each floor). Sanitary wastewater generated is sent to municipal sewer line.
- Sewage treatment plant of 130 KLD capacity for the treatment of sanitary wastewater generated in the campus is under construction. STP will comprise of primary and secondary treatment (biological treatment) followed by filtration.

Recommendations:

Treated sanitary wastewater can be recycled for toilet flushing by providing dual pumping system.

3.3 Solid Waste Management

As per Solid Waste Management Rules, 2016 waste segregation at source is mandatory in order to recognise that waste is a resource which needs to be recovered/ reused and recycled. Bulk generators such as institutions, commercial areas and gated communities have to segregate waste into three categories- Biodegradables, Dry (Plastic, Paper, metal, Wood etc.) and Domestic Hazardous waste (diapers, napkins, mosquito repellents, cleaning agents etc.) before handing it over to the waste collector.

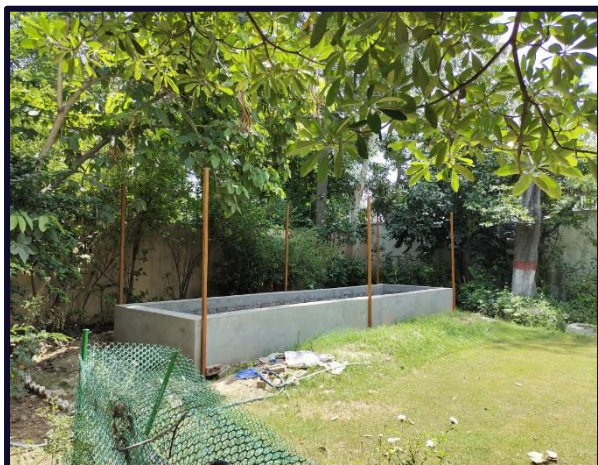
Plastic Waste Management Rules, 2016 (Amended in 2018) address the issue of carry bags by setting minimum standards of banning less than 50 micron thickness plastic carry bags and a mandate for retailers to charge a fee for each plastic bag made available.

The wet (food/ organic) waste is generated from canteen in small quantity. Daily around 25-50 kg biodegradable dry waste is generated in the campus which includes horticultural waste. Quantity of horticulture waste varies significantly due to seasonal variation, e.g. around 50-70 kg of horticulture waste is generated daily in February- March due to leaf fall.

In other areas like classrooms, mostly paper waste and plastic wrappers are generated.

Observations:

- a) Segregation of wet and dry waste is practised within the campus. Blue and Green covered/ pedal-pushed dustbins are placed in the premises. Waste bins are provided on each floor, in staff rooms, laboratories, washrooms, kitchen and in campus area.
- b) College had vermicomposting unit for the treatment of horticulture waste which was dismantled during construction of a new building. Recently, College has installed new vermicomposting unit (10x1x1 m) for the treatment of horticulture waste generated in the campus. The unit will be operational in 2-3 months.
- c) College has initiated the process of installing a composting unit of 25-30 kg/ day capacity. Composting unit will process food waste generated in kitchen and some horticulture waste.
- d) There is no signage for promoting segregation of wet and dry waste.
- e) College has taken steps to minimise and avoid paper usage:
 - i. Prints and photocopies are taken on both sides of the pages.
 - ii. Digitalisation (scanning) is practiced.
 - iii. The library has E-book system where books and journals are available online.
 - iv. College has Digital Notice board and Learning Management System (LMS) where notices are sent, exam results are displayed and attendance is recorded digitally.
 - v. Some quantity of paper waste is recycled in the Paper Recycling Unit of 5 kg capacity placed in college campus. Paper recycled is used for laboratory work. Remaining paper waste is sent to local vendor for recycling.
- f) College encourages students to use eco-friendly material and recycle old papers/ scrap for decoration purpose during college festivals.
- g) College strictly follows the guidelines regarding plastic usage and has prohibited the use of single use plastic e.g. carry-bags, glasses, spoons etc., in the campus. Canteen Contractor is prohibited to use plastic cutlery, instead paper plates and wooden spoons are used.



Vermicomposting pit



Paper recycling unit

Recommendations:

- a) Inventories of all solid waste generated in the premises must be maintained to monitor the waste generation.
- b) College can install sanitary napkin disposal facility.
- c) Training and awareness programs should be organized on segregation of biodegradable waste and recycling of waste. Efforts should be taken to inform students about recycling options for dry waste.
- d) College can upgrade the waste segregation practices and segregated dry waste can be recycled in-house or handed over the recyclers to enable circular economy. 'Waste to wealth program' can be undertaken by the students, plastic waste can be segregated & sent to plastic recyclers and PET bottles collection/ recycling unit can be installed.
- e) College can closely work with companies who have Extended Producer Responsibility (EPR) where students and staff can segregate plastic waste from community.

3.4 E-Waste

E-waste is defined as electrical and electronic equipment, accessories which are not in use, whole or in part or rejects from their manufacturing and repair process which are intended to be discarded. E-waste is broadly comprised of discarded computer monitors, motherboards, mobile phones and chargers, compact discs, headphones, Cathode Ray Tubes (CRT), Printed Circuit Boards (PCB), televisions etc.

E-waste is covered under the E-Waste (Management and Handling) Rules, 2011 (Amended in 2018) which are under Hazardous Waste Management (HWM) Rules umbrella. These Rules were brought into force to enable regulated recovery and/or reuse of useful material from E-waste and prevent pollution due to its disposal. Under the regulation, it is mandatory for the University to hand over/ sale the E-waste to authorised recyclers only.

Observations:

E- waste is collected, segregated & stored in college campus and sent to authorised vendor for recycling/ disposal under buy-back policy. Two E-waste documents dated 05.11.2018 and 18.02.2019 from 'Nishta Innovative Solution' for old UPS/SMF batteries of 12V/ 42ah SMF were available for review. The documents mentioned the quantity of batteries sent to Nishta Innovative Solution for disposal.

Recommendations:

Records of E-waste generation and disposal are to be maintained properly. College should maintain the inventory mentioning type and quantity of waste generated e.g. computer monitors, scanners, keyboards, cables, circuit boards, batteries etc.

3.5 Energy Efficiency

Observations:

Electricity:

- a) Common electricity meter is provided for entire campus. The areas of major consumption of electricity are:

Tube Lights & LEDs	388+ (30% LEDs)
Fans (ceiling fans & wall fans)	425
Air Conditioners	49
Computers (desktops & laptops)	1254
Projectors	45
Water purifiers	4
RO system of 1 KLD	1

- b) Latest bills were not available for review. Hence, it is difficult to comment on electricity consumption.
- c) College has 49 air conditioners with two/ three/five -star ratings (6 five Star, 11 three star and 32 two star) [Standards set by Bureau of Energy Efficiency (BEE)].
- d) An Uninterruptible Power Supply (UPS) system is provided in computer laboratories. UPS system is used to protect hardware viz. computers, data centers, telecommunication equipment or other electrical equipment where an unexpected power disruption could cause serious business disruption or data loss.
- e) Common switches are provided for some tube-lights & fans.
- f) Instructions regarding switching off the electrical appliance were seen in laboratory notice boards, however, signage are not provided near electrical switch boards. Signage can encourage & help users to switch off light and fans to save electricity.
- g) For efficient energy consumption and saving on electric bill, Shivaji College has initiated the process of replacing traditional lights with LEDs.

LPG Gas

- LPG cylinders are used mainly in canteen kitchen for cooking and in chemistry, botany, zoology and biochemistry laboratories. Inventory of cylinders usage was not available for review. 1 cylinder of 19 kg generates 881.6 MJ (Mega Joules) of energy.
- Storage facility for LPG cylinder is located on ground floor. All the commercial LPG gas cylinders were in vertical position with access control; however it is necessary to provide extra support system like chain in order to prevent cylinders from falling, movement or physical damage. ([http://peso.gov.in/Work Mannual/Gas cylinder Rule WM.pdf](http://peso.gov.in/Work_Mannual/Gas_cylinder_Rule_WM.pdf))

Diesel Generator

Campus has a diesel generator (DG) of capacity 100 KVA. DG set is used only in case of emergency when there is power cut-off. DG emissions are not monitored.

Solar System

On grid Rooftop Solar PV System of 75KWH has been installed on terrace in December 2016 by Tata Power Solar Systems Limited. The solar facility exports more than 1000 units per month to the Northern Grid of the country. Cleaning of solar panels is done by College's maintenance team and the system is maintained by Tata Power Solar Systems Limited.



Rooftop Solar PV System



Diesel Generator

Recommendations:

- It is recommended to conduct Energy Audit to assess existing energy balance, analyse the gap between present performance and benchmark. It will help College to implement energy efficient operational strategies and adopt Energy Conservation Measures (ECM) effectively.
- College is procuring LED lights and electrical equipment with star ratings. SOPs should be prepared and followed for purchasing green equipment, equipment star rating and eco-friendly materials.
- Mirror optic reflectors can be retrofitted on existing tube lights as the reflectors can spread light to

relatively large areas. Control sensors can help to reduce consumption by automatically dimming lights when people are not around.

- d) Raising awareness is crucial for energy saving. Notices/ signage can be displayed near switches, thus reminding students and staff to switch off all electricals when not in use.

3.6 Air Emissions

Diesel generators, exhausts from kitchen and chemical vapors in chemistry laboratory generate emissions. Exhaust fans are provided in science laboratories, washroom and kitchen.

No vehicle entry is allowed in the College campus except for dignities & differently abled students. Separate parking area for vehicles is available outside the campus.

Recommendation:

It is recommended to measure emissions from diesel generator & ambient air quality at least once a year and results should be compared with Indian Ambient Air Quality Standards.

<https://scclmines.com/env/DOCS/NAAQS-2009.pdf>

3.7 Indoor Air Quality

Indoor Air Quality (IAQ) refers to the air quality within and around buildings and structures, as it relates to health and comfort of building occupants. Common indoor pollutants are listed as below:

- Carbon monoxide – Sources of carbon monoxide are incomplete combustion of fossil fuels
- Volatile organic compounds (VOCs) – VOCs are emitted by paints and lacquers, paint strippers, pesticides, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions etc.
- Carbon dioxide – Due to human respiration
- Particulate matter (PM) – Due to construction and maintenance activities, vehicular pollution
- Nitrogen Oxides- Due to vehicular pollution

In the kitchen/Canteen area, parameters responsible for affecting indoor air quality are,

- Type and quantity of fuel used
- Medium of cooking
- Type of cooking e.g. roasting, frying, steaming etc.
- Duration of cooking, quantity of food being cooked
- Efficiency of ventilation

Indoor air quality should be monitored at least once in a year and results should be compared with The Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) standards for indoor air quality:

https://www.ishrae.in/Content/Download/ISHRAE IEQ Feb 26 2019_public_draft.pdf

Observations:

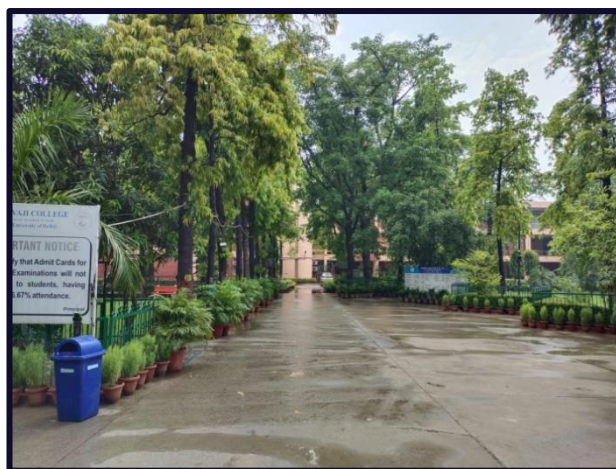
- In classrooms, ventilation is natural draft (through windows) and is enhanced by fans. In corridors, cross-ventilation is observed. Air conditioners are used in some offices and computer laboratories. As informed by College, ACs are serviced regularly to ensure indoor air quality.
- Exhaust fans are provided in science laboratories, washrooms and kitchen.
- Green belts have been set up in the campus, indoor plants are present in the College building which helps in maintaining ambient air quality.

Recommendations:

Awareness to be created on importance of maintaining indoor air quality.



Indoor plants



Green belt in campus

3.8 Lights and Acoustics

Observations:

- Although located in city area, vehicular noise pollution is minimum in the premises probably due to dense tree cover in the campus. Noise levels are between 50-70 dB(A) in the premises.
- Light intensity and noise levels were monitored at 16 different locations and the results are presented in **Table 2**.

Table 2: Light intensity and noise levels monitoring results

Sr. No.	Location	Light Intensity (Lux)	Average Noise (dB(A))
	Ground Floor		
1	Chemistry Laboratory- 1	71 (Sunlight)	63
2	Lobby	-	67-68
3	Chemistry Laboratory- 2	58 (Sunlight)	62-66
4	Principal's Office	450 (Artificial + partial sunlight)	62-64
5	Staff Room	100 (Artificial + partial sunlight)	58-62
6	Ground Floor Classrooms (BH-7,8)	64 (Sunlight)	50-67
	First Floor		
7	Library	78 (Sunlight)	42-45
8	Physics Laboratory	79 (Sunlight)	61-64
9	Zoology Laboratory	110 (Artificial + partial sunlight)	56-61
10	First Floor Classrooms (110,108)	70 (Sunlight)	62-65
	Second Floor		
11	Botany Laboratory	80 (Sunlight)	60-62
12	Second Floor Classrooms (201,210)	80 (Sunlight)	51-56
	Third Floor		
13	Biochemistry Laboratory	77 (Sunlight)	60-65
14	Main gate	-	65-70
15	Main Passage	650 (Artificial + partial sunlight)	62-69
16	Administration Department	79 (Sunlight)	65-69

- c) As per the Occupational Safety and Health Administration (OSHA) standards, permissible noise exposure for 8 hours/day is 90 dB(A). (<https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.95>).
- d) Colleges, schools, hospitals and courts come under silent zone. (http://cpcbenvi.nic.in/noisepollution/noise_rules_2000.pdf). Permissible noise limits in and near the College is 50 dB(A) during day time and 40 dB(A) during night time.
- e) Noise levels monitored during the audit are above the permissible limits at all locations.
- f) The illumination (Lux) levels were adequate or less in few areas that is because lights are kept switched off in rooms, laboratories which are not occupied and receive natural sunlight.

Recommendation:

Motion and daylight sensors can be installed to save electrical energy.

3.9 Environmental and Sustainability Initiatives

- a) College has 'Eco Club' and the Garden Committee which offers wide spectrum of environmental and nature activities and platforms to enhance awareness and exhibit the relationship with nature. The National Service Scheme (NSS) and National Cadet Corps (NCC) of the college undertakes projects for environment, rural development, education awareness, healthcare etc. Various activities like cleanliness drive, tree-plantation, seminars and workshops are organised by 'Eco Club'/ Garden Committee/ NCC/ NSS increase the awareness and sensitivity among students and faculty.
- b) College has demonstrated consistent commitment towards nature and environment by organizing different events for the last 6 years. Details of various environmental activities arranged by Eco Club, NCC, NSS and Garden Committee were available for review.
- c) Students participate in innovative workshops and campaigns like solar lamp making, refill the pen campaign, etc. Visit to biodiversity parks, wetlands and other places of ecological importance are also being arranged by Eco Club. In the current scenario when academic activities are taking place virtually, College arranges webinars, online conferences pertaining to environment. Some activities organised were-
 - Field visits arranged to Najafgarh Drain, National Zoological Park, Kamla Nehru Park, Sultanpur National Park, Yamuna Biodiversity Park and Okhla Bird Sanctuary
 - Tree plantation drive organized by Eco Club on September 5, 2016 and by Garden Committee on September 5, 2020
 - Various conferences, guest lectures organized by the College including National Conference on 'Globalisation, Economic Development and Sustainability' (March 29, 2016), Conference on 'Environmental Pollution and Health in Urban Ecosystems (EPHUE-2016)' on June 23, 2016, Lecture on 'Climate Change and India' by Dr. Subodh Sharma (December 4, 2017)
 - Word Ozone day celebration organized by Eco Club on September 15, 2018 and September 13, 2020 which included seminar, tree plantation drive, intercollege competitions on poster making, essay writing etc.
- d) Eco Club instituted 'Dr. Panjabrao Deshmukh Memorial Running Trophy' for Innovative Green Model a Solution for Environmental Issues in 2019. The trophy was awarded for "Water Recirculation Model" on September 29, 2020.

Recommendations:

- a) The world is facing problems due to climate change leading to water scarcity and sustainable resource management. Creating awareness on mitigation of adverse impacts on environment, sustainable resource management and conservation of the ecosystem, has increased importance in any educational institute. It is necessary to create as much awareness as possible and sensitize students. Awareness sessions help students to understand the effect of their actions & inactions on the environment, build knowledge and skills necessary to address complex environmental issues and encourage them to keep our environment healthy and sustainable.
- b) Records of green and environmental initiatives conducted by College should be maintained properly which will include aim & objective of the initiative, details in brief and outcome.
- c) Consider setting up an environmental advisory committee under 'Eco Club' with students'

involvement. The discussions & information sharing among different departments can generate ideas and awareness on environmental issues.

- d) Adopt environmental responsible purchasing policy and work towards creating and implementing a strategy to reduce environmental impact.



Tree plantation drive



Field visit to Okhla Bird Sanctuary



Flyer of poster making competition



World Ozone Day Celebration

4. Initiatives taken by Shivaji College

College is actively organising initiatives incorporating environment friendly activities.

College has taken green steps by installing a renewable energy system, rainwater harvesting system, vermicomposting, establishing Eco Club & Garden Committee, a paper recycling unit, promoting eco-friendly activities etc.

Understanding the importance of efficient energy use, College has initiated the process of replacing all incandescent lights with LEDs.

College has installed a rooftop solar PV system of 75 KWH capacity in December 2016.

Sewage treatment plant is under construction. Water treated in STP will be used for non-potable activities such as flushing, gardening, etc. in the campus.

College has a large number of trees on campus. 1800+ trees, shrubs and potted plants present in the campus.

Annexure 1: List of Stakeholders Interviewed

Stakeholders interviewed during the audit

Virtual tour of Shivaji College was conducted on 17.06.2021. During the visit, College campus, College building (classrooms, laboratories, etc.), solar panels, rain water harvesting system, paper recycling unit, green belt, RO plant, LPG storage area were visited virtually and following stakeholders were interviewed.

Sr. No.	Stakeholder Name	Designation
1	Dr. Virat Jolli	Assistant Professor, Department of Environmental Studies (Virtual tour coordinator)
2	Mr. Ravi	PA, Library
3	Mr. Ved	RO Operator, Cleaning & Maintenance
4	Mr. Rahul Rajak	Gardener
5	Mr. Jitendra Kumar Jena	Caretaker, Water Management
6	Ms. Meenakshi	Cleaning in charge
7	Mr. Ratandeep	Computer Laboratory In charge

Faculty, Non- teaching Staff & Students Interviewed Individually over Telephone

Sr. No.	Stakeholder Name	Designation, Department	Date
1	Dr. Ashwani Sharma	Assistant Professor, Department of Environmental Studies	Overall Audit coordinator
2	Dr. Bishu Sathpaty	Assistant Professor, Department of Political Science	17.06.2021
3	Dr. Mridula Budhraj	Assistant Professor, Department of Mathematics	17.06.2021, audit coordinator
4	Dr. Prabuddh Mishra	Assistant Professor, Department of Geography	17.06.2021
5	Dr. Gyanendra Pandey	Assistant Professor, Department of Physics	17.06.2021
6	Dr. Richa Arora	Assistant Professor, Department of Chemistry	18.06.2021
7	Priya Shaw (Contractor)	Incharge for Horticulture, cleaning & waste management	17.06.2021
8	Neha	Student, SY Physics	17.06.2021
9	Yashika	Student, TY Zoology	17.06.2021
10	Naman Gupta	Student, FY Biochemistry	17.06.2021