# S. D. College, Barnala

## Energy Audit Report

(2022-23)

**Prepared By**

**Energy & Sustainable Development Committee**

S. D. College, Barnala

**Audit Date: 22 July 2023**

Principal
S.D. College, BARNALA

# Energy & Sustainable Development Committee

## S. D. College, Barnala

| Sr. No. | Name & Designation | Capacity | |
|---|---|---|---|
| 1. | Dr. Sanjay Kumar Singh<br>Department of Physics | Convenor | |
| 2. | Prof. Ashwani Sikri<br>Head, Department of Mathematics | Co-convenor | |
| 3. | Prof. Ashutosh Dharni<br>Head, Department of Computer | Member | |
| 4. | Prof. Satpal Singh<br>Department of English | Member | |
| 5. | Prof. Gurkeert Singh<br>Department of Mathematics | Member | |



Principal
S.D. College, BARNALA

# ENERGY AUDIT

# CERTIFICATE

This is to certify that an **"Energy Audit" (Session 2022-23)** was performed in July 2023 for S. D. College, Barnala to evaluate energy expenses, the availability and dependability of the energy supply, energy conservation systems, and measures to minimize energy usage.

**Place:** Barnala

**Date:** 22 July 2023

Dr. Sanjay Kumar Singh

**Convener**

Prof. Ashwani Sikri

**Co-convener**

Principal
S.D. College, BARNALA

## Preface

The Energy & Sustainable Development Committee for the Session 2022–23 conducted the energy audit of the S. D. College, Barnala. This audit was created to determine the college's energy efficiency. The primary goal of this auditing was to identify the electrical appliances that would use the least amount of energy. The Energy & Sustainable Development Committee carefully examined the institute's energy data. The information was gathered from every area of the campus, including the staff room, library, and labs. The report's count of the electronic and electrical devices utilised at the college, including fans, CFL bulbs, LED bulbs and tubes, tube lights, floodlights, air conditioners, computers, UPSs, and more, has been completed.

Principal
S.D. College, BARNALA

## Acknowledgement

We owe a debt of gratitude to Dr. Rama Sharma, the principal, and Dr. Rajesh Gupta, the coordinator (IQAC & NAAC), for inspiring us to do an energy audit. We also appreciate the participation of the teaching and non-teaching staff members during the data collection process. Moreover, we would like to thank Sh. Jaswinder Singh, the electrician for all of their help with this project.

Principal
S.D. College, BARNALA

## 1. Brief History about the college

- **Name of the College: S. D. College, Barnala-148101, Punjab**
- **Campus Area: 6.2 Acre**
- **Build up area: 3. 5 Acre (Approx)**
- **Year of establishment: 1956**

The S.D. College Educational Society (Regd.), Barnala, which runs the S. D. College, which is one of the area's most illustrious institutions and has been providing high-quality education for the past 67 years. Under the leadership of the founding president, Dr. Raghubir Parkash, the founding member, Pandit Anand Sarup, and all other members who worked in unison to build this college, S.D. College has made amazing development. Dr. Raghubir Parkash laid the cornerstone for S.D. institution, which was first an arts institution, in 1956. The institution has been improving its academic programmes and physical facilities since its inception. Currently, it has multiple faculties in order to address the problems of the modern era.

In order to build a strong foundation of educated citizens, additional faculties have been added to the school. The Science faculty was established in 1962, and the Commerce faculty in 1974. To cater to the professional needs of people from Barnala and adjoining rural areas, some Technical and Professional programmes like B.C.A., B.B.A., B.Sc. (M/NM), B. Lib. & Info. Sci., M.Sc. (IT), M.Sc. (IT) Lateral Entry, M.A. (English & Punjabi), M.Sc. (Mathematics), M.Com., B.Voc (Medical Laboratory & Molecular Diagnostic Technology), B.Voc (Journalism and Mass Technology), B.Voc (Software Development), B. Voc (Health & Nutrition) have been started.

Principal
S.D. College, BARNALA

S.D. College Barnala has carved a niche for itself in the field of education in this Malwa region thanks to the admirable accomplishments of our students in both academic and extracurricular activities. It has been a constant effort on the part of the college to shape the young minds to think & dream big, for we believe that a man's dreams are an index to his greatness.

## 2. Introduction

Electrical energy is regarded as making a significant contribution to a nation's economic development. The fundamental objective of an energy audit is to create a balance between energy facilities and sources that are readily available without sacrificing efficiency by favouring high efficiency equipment that consumes less energy. The energy audit was carried out by tracking the electricity consumption, supply, and requests of all fans, air conditioners, computers, and other electrical equipment in the departments, offices, libraries, and labs. Our group has researched the cost of electricity over a year and the return on investment.

This study is entirely based on data that was gathered from the college and includes all necessary plans and suggestions to increase and decrease the amount of electricity used as well as a basic analysis of energy use to reduce any negative environmental effects. This report is intended to assist in reducing the college's energy use to the absolute minimum.

## 3. Energy Audit

A building's energy usage is examined as part of an energy audit to assist pinpoint the causes of high energy usage. Energy & Sustainable Development Committee members

Principal
S.D. College, BARNALA

do a complete walk-through examination as part of an energy audit, and they then report back with their findings and suggestions for increasing energy efficiency.

### 3.1. Data Collection

All required data is collected by counting electronic and electrical appliances like LED bulbs & tubes, fans, CFLs, tube lights, flood-lights, air conditioners, computers, UPS etc. which we are using in the college.

## Total Power Requirement for Various Equipments (from 10th April to 10th May 2022)

| Sr.No. | Items | Electric power (Watt) | Quantity | Daily uses (In hours) | Per Month (Watt) | Unit | Cost in a month |
|---|---|---|---|---|---|---|---|
| 1 | Fan | 75 | 449 | 3 | 2525625 | 2525.63 | 13562.606 |
| 2 | LED Tube | 25 | 253 | 2.5 | 395312.5 | 395.313 | 2122.8281 |
| 3 | LED Bulb | 12 | 66 | 2.5 | 49500 | 49.5 | 265.815 |
| 4 | CFL | 30 | 33 | 2 | 49500 | 49.5 | 265.815 |
| 5 | AC(1.5T) | 2000 | 20 | 2.5 | 2500000 | 2500 | 13425 |
| 6 | Duct AC | 12900 | 1 | 2.5 | 806250 | 806.25 | 4329.5625 |
| 7 | Fridge | 300 | 11 | 6 | 495000 | 495 | 2658.15 |
| 8 | Computer | 200 | 124 | 2.5 | 1550000 | 1550 | 8323.5 |
| 9 | Microwave | 1400 | 6 | 1 | 210000 | 210 | 1127.7 |
| 10 | Projector | 250 | 8 | 1 | 50000 | 50 | 268.5 |
| 11 | Geezers | 2000 | 1 | 0 | 0 | 0 | 0 |
| 12 | Tube set | 40 | 145 | 2 | 290000 | 290 | 1557.3 |
| 13 | Water cooler | 1000 | 4 | 5 | 500000 | 500 | 2685 |
| 14 | Motor(Pump) | 100 | 1 | 1 | 2500 | 2.5 | 13.425 |
| 15 | Patiz Machine | 200 | 1 | 3 | 15000 | 15 | 80.55 |
| 16 | Inverter | 1500 | 4 | 3 | 450000 | 450 | 2416.5 |
| 17 | TV | 50 | 3 | 2 | 7500 | 7.5 | 40.275 |
| 18 | Modem | 12 | 15 | 24 | 108000 | 108 | 579.96 |
| 19 | Photostat machine | 900 | 2 | 1 | 45000 | 45 | 241.65 |

Principal
S.D. College, BARNALA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20 | UPS | 150 | 12 | 0.5 | 22500 | 22.5 | 120.825 |
| 21 | UPS (B.Voc MLMDT) | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| 22 | UPS (B.Voc soft Devt.) | 1000 | 1 | 0.5 | 12500 | 12.5 | 67.125 |
| 23 | UPS(Computer Lab1) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| 24 | UPS(Computer Lab2) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| 25 | UPS (Library) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| 26 | UPS (Admin Block) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| 27 | Exhaust Fan (Large) | 250 | 2 | 3 | 37500 | 37.5 | 201.375 |
| 28 | Exhaust Fan(Small) | 50 | 32 | 4 | 160000 | 160 | 859.2 |
| 29 | Oil heater | 3000 | 1 | 0 | 0 | 0 | 0 |
| 30 | Blower | 2000 | 1 | 0 | 0 | 0 | 0 |
| 31 | Electric kettle | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| 32 | Camera | 50 | 25 | 24 | 750000 | 750 | 4027.5 |
| 33 | RO Plant | 8000 | 1 | 6 | 1200000 | 1200 | 6444 |
| 34 | Flood Light | 50 | 12 | 10 | 150000 | 150 | 805.5 |
| 35 | Currency Machine | 80 | 1 | 2 | 4000 | 4 | 21.48 |
| 36 | Barcode Printer | 70 | 1 | 0.2 | 350 | 0.35 | 1.8795 |
| 37 | Internet Server | 50 | 4 | 24 | 120000 | 120 | 644.4 |
| 38 | S.D College Nameplate | 400 | 1 | 8 | 80000 | 80 | 429.6 |
| 39 | Farata Fan | 250 | 1 | 2 | 12500 | 12.5 | 67.125 |
| 40 | Laptop | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| 41 | Blower Cleaning | 700 | 1 | 0.1 | 1750 | 1.75 | 9.3975 |
| 42 | Vacuum Cleaner | 1400 | 1 | 0.1 | 3500 | 3.5 | 18.795 |
| 43 | Printer | 400 | 24 | 1 | 240000 | 240 | 1288.8 |
| 44 | Washing Machine | 2000 | 1 | 0.2 | 10000 | 10 | 53.7 |
| 45 | Cooler | 250 | 4 | 8 | 200000 | 200 | 1074 |
| 46 | Smart Board | 150 | 1 | 2 | 7500 | 7.5 | 40.275 |
| 47 | Audio Deck | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| 48 | Vendego Machine | 50 | 1 | 0.1 | 125 | 0.125 | 0.67125 |
| | Total (Rs) | | | | | 13346.4 | 71670.235 |

**Power Consumptions from Electricity Board (PSPCL)(Account Numbers 3002944859 )**

Principal
S.D. College, BARNALA

| S. No. | Month | Consumption Unit(KWH/KVAH) | Total amount(Rs) |
|---|---|---|---|
| 1 | 10 April to 10 May 2022 | 8446 | 72880 |
| 2 | 10 May to 10 june 2022 | 12279 | 106930 |
| 3 | 10 June to 10 july 2022 | 11288 | 100780 |
| 4 | 10 July to 10 August 2022 | 11956 | 103790 |
| 5 | 10 August to 10 September 2022 | 11933 | 103600 |
| 6 | 10 September to 10 octuber 2022 | 10942 | 96100 |
| 7 | 10 Octuber to 10 November 2022 | 4724 | 47830 |
| 8 | 10 November to 10 December 2022 | 3321 | 36620 |
| 9 | 10 December to 10 January 2023 | 2696 | 32160 |
| 10 | 10 January to 10 Feb 2023 | 2635 | 31730 |
| 11 | 10 Feb to 10 March 2023 | 2777 | 31740 |
| 12 | 10 March to 10 April 2023 | 3152 | 35730 |
| | Total | 86149 | 799890 |

**Total consumption of one accounts for 12 Months= 86149 (KWH/KVAH)**

**Total consumption of one accounts for One Month=7179.1 (KWH/KVAH)**

| Account Numbers 3002944861 | | | |
|---|---|---|---|
| S.No. | Month | Solar System Units | Amount |
| 1. | 28 May to 28 June 2022 | 2561 | 25990 |
| 2 | 28 June to 29 July 2022 | 2363 | 22390 |
| 3 | 29 July to 29 August 2022 | 2591 | 10630 |
| 4 | 29 August to 30 September 2022 | 2623 | 33910 |
| 5 | 30 September to 28 October 2022 | 2491 | 10400 |
| 6 | 28 October to 29 November 2022 | 1910 | 5440 |
| 7 | 29 November to 30 December 2022 | 1595 | 8310 |
| 8 | 30 December to 27 January 2023 | 1378 | 7730 |
| 9 | 27 January to 27 February 2023 | 2273 | 5310 |
| 10 | 27 February to 29 March 2023 | 2574 | 5130 |
| 11 | 29 March 2023 to 28 April 2023 | 2936 | 5130 |
| 12 | 28 April 2023 to 29 May 2023 | 2844 | 6000 |
| | Total | 28139 | 146370 |

Principal
S.D. College, BARNALA

**The entire amount of power generated by the solar power plant is 77.1 units each day, or 28139 units in a year, which is 32.66 % of the total amount of power used by the college (86149 units).**

**Two generators with a combined power capacity of 15 KW and 20 KW are used by the college to handle the electricity during power outages as well. In order to save electricity, HRC switches, curtains, and earthing were put in offices and labs in accordance with the suggestions made in the previous year's Energy Audit Report.**

## 4. Recommendations

On the basis of the data analysis, energy & sustainable development committee recommends the following steps for reducing power consumption

**[1] Install Motion Sensors in toilets to switch off the lights when there is no movement automatically.**

**[2] Energy management by organising expert lectures in the area of energy conservation.**

**[3] The Institute should continuously review and update the approved policy and committed to its implementation.**

**[4] To improve energy efficiency department wise main On/off switch installed in case someone forgets to switch off while leaving the rooms.**

**[5] Faculty members are given adequate training for energy audit procedures for sustainable institutional and household energy conservation.**

**[6] Use of reflectors for utilizing the Sun light. Fall ceiling in A.C rooms & Use of Computers in power saving mode.**

**[7] Use of department wise main On/off switch.**

**[8] Installations of more Solar Plant.**

**[9] Use of solar cell Street light.**

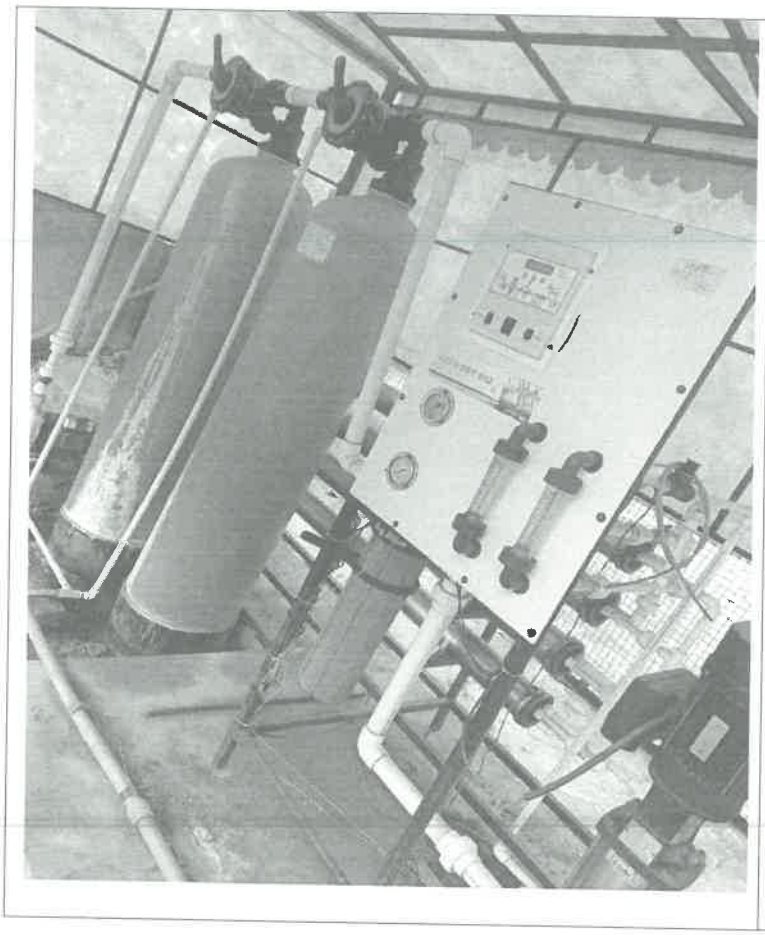
Principal
S.D. College, BARNALA

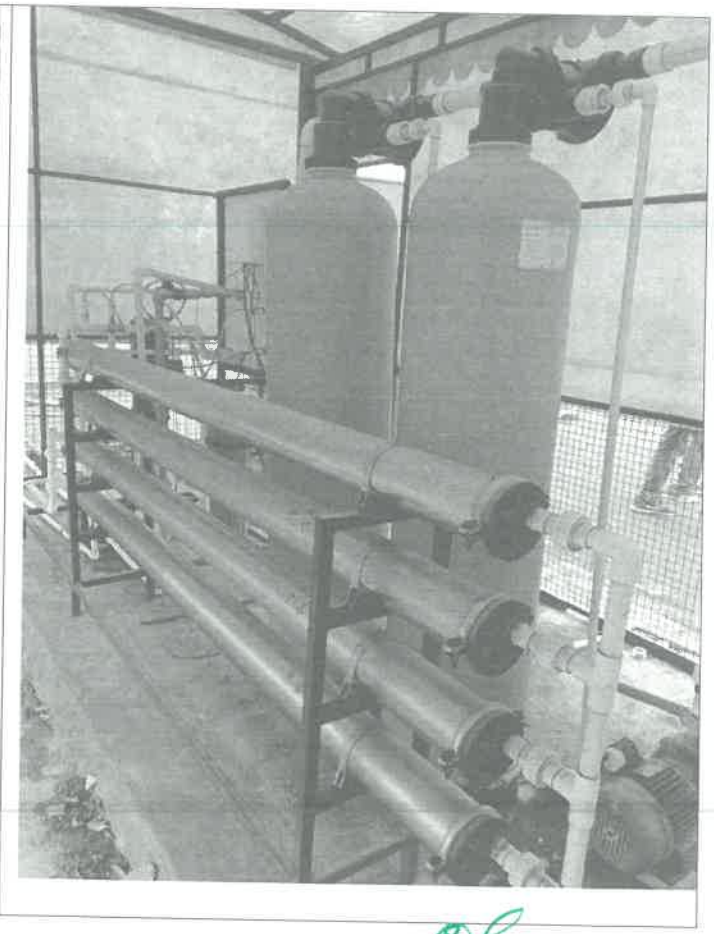
## 5. Results and discussion:

The biggest issue with educational institutions is energy audit. We gathered statistics by taking into account things like fans, CFL bulbs, tube lights, floodlights, air conditioners, computers, UPSs, and LED bulbs and tubes. The average monthly energy consumption for all devices is **7179.1** Unit.

## 5. Conclusion

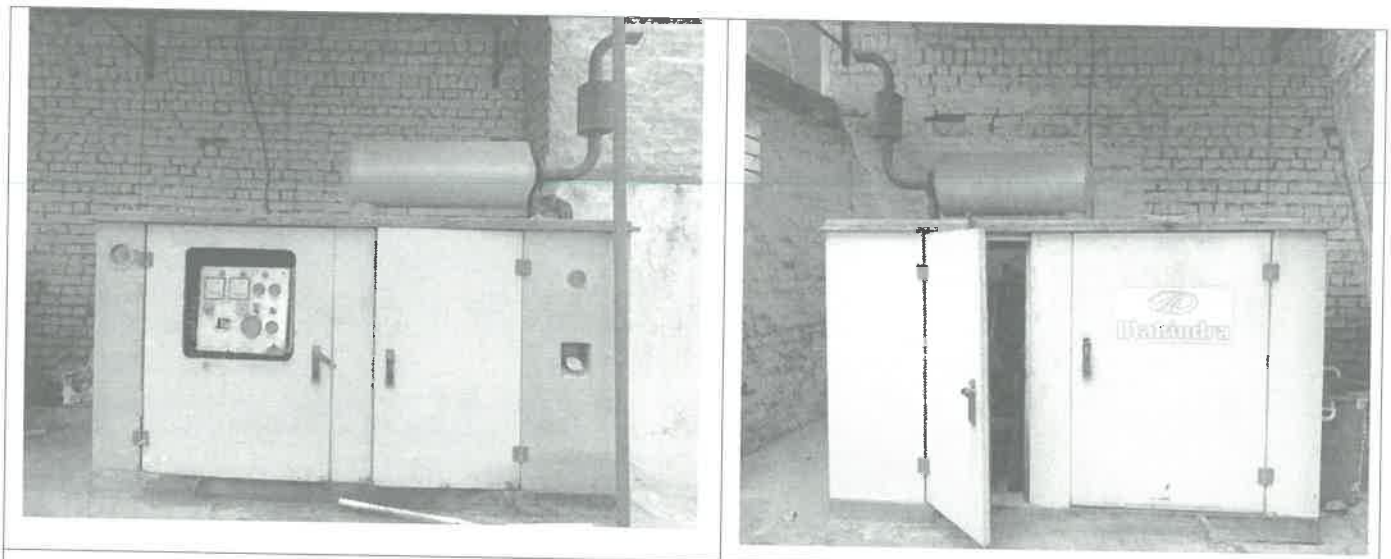
Energy cost reduction and preventive maintenance are given a favourable direction by the energy audit. To comprehend how energy is distributed and used in the college, it is helpful to grasp the data produced by the energy audit. The college can only use **7179.1** units of power each month at most.





Principal
S.D. College, BARNALA

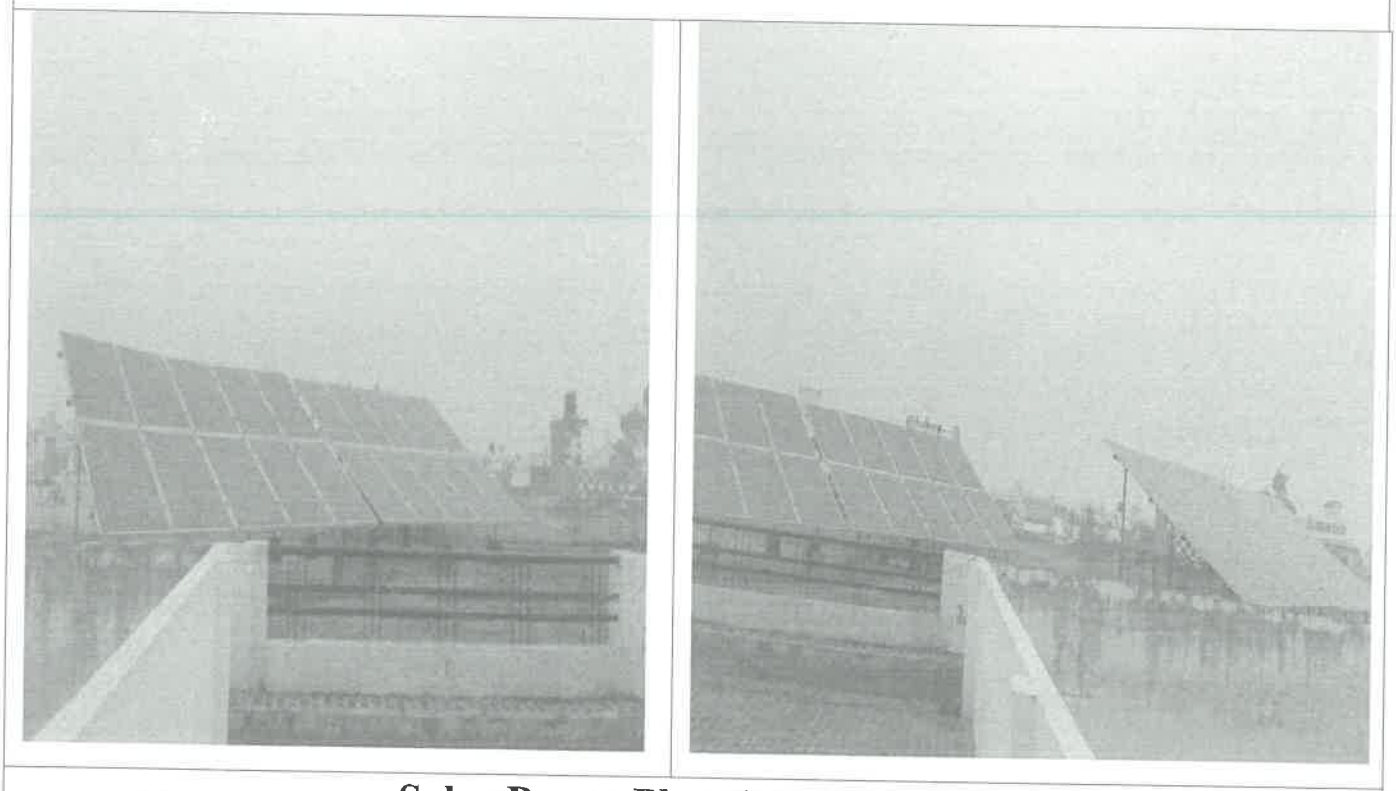
**Centralised R. O. Plant in the College**



**Diesel Generator (15KW+20KW) in the College**

Principal
S.D. College BARNALA

**Use of LEDs in Computer Lab 1**



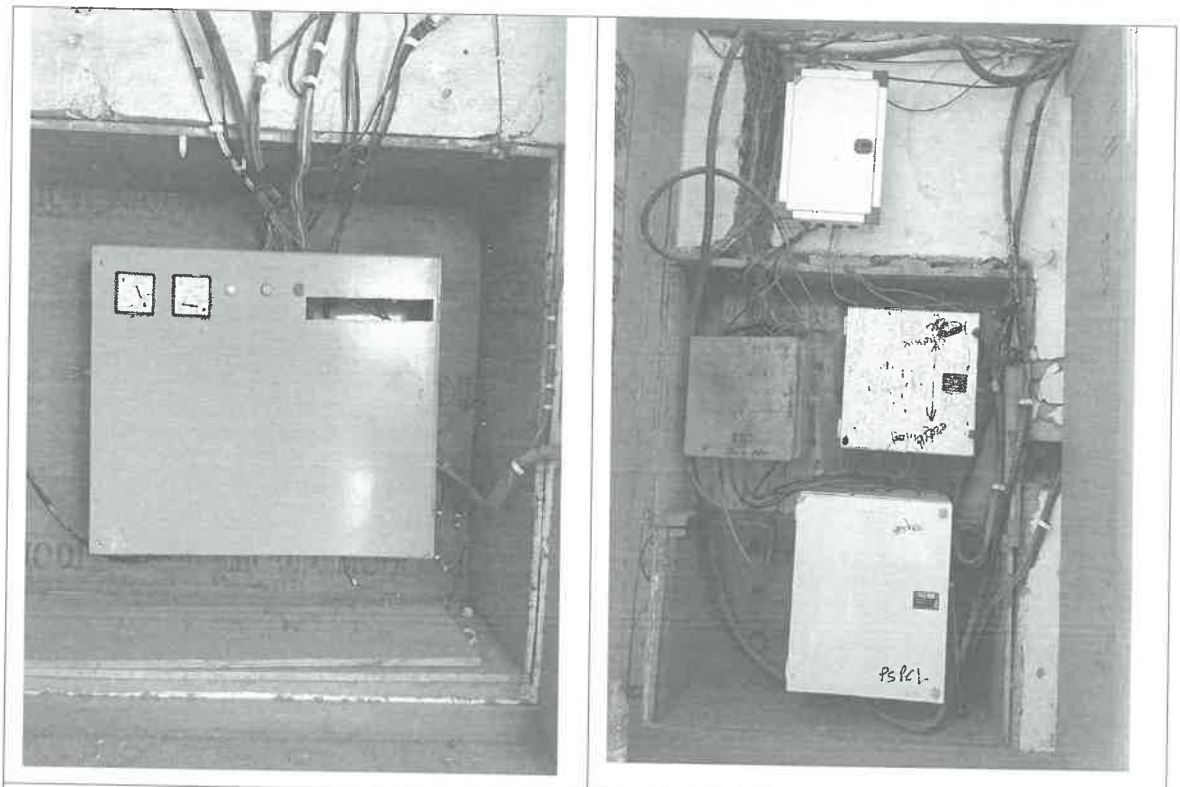
**Solar Power Plant in the College**

Principal
S.D. College, BARNALA

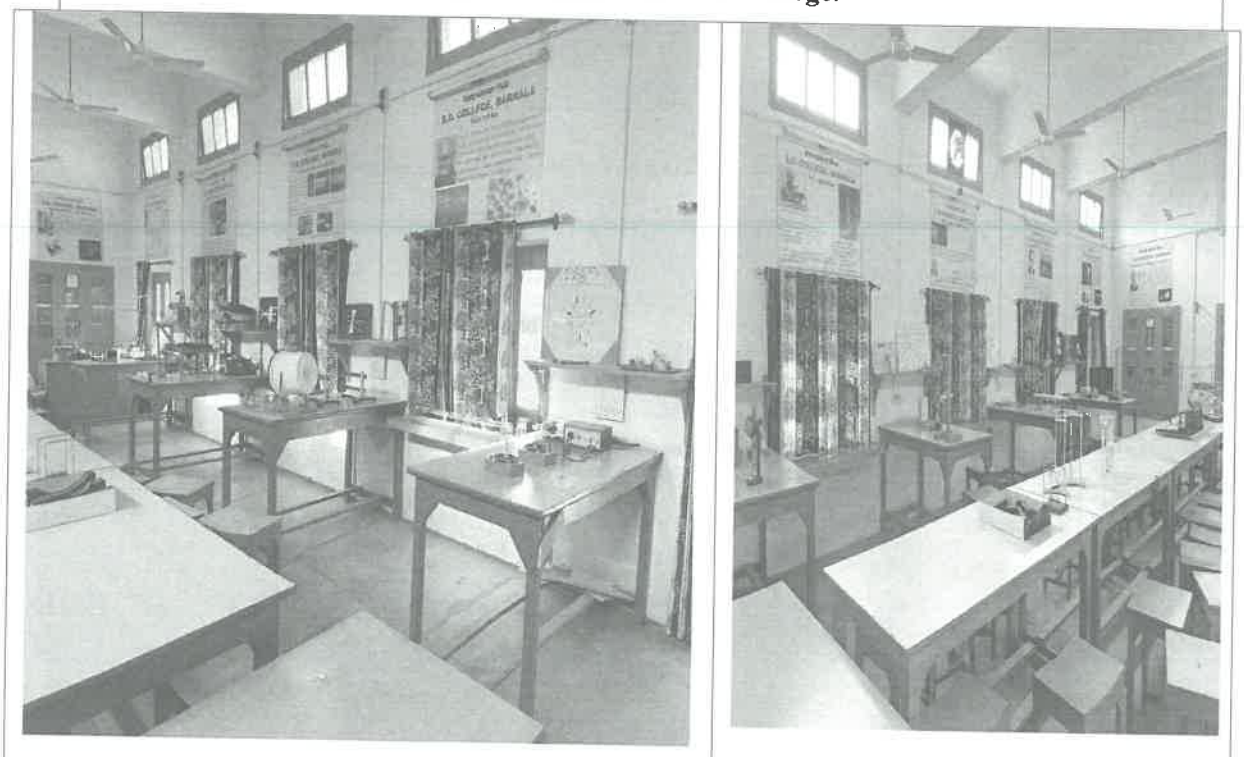
**Curtains fitted in offices**

**Power supply Earthing for resolving fluctuations in supply**

Principal
S.D. College, BARNALA



**HRC Switches fitted in College.**



**Curtains fitted in Goswami Ganesh Dutt Innovation Hub, Department of Physics**

Principal
S.D. College, BARNALA

# Action Taken Report
# (Session 2022-2023)

**S. D. College, Barnala is established with the aim of promoting green practices in and beyond the institution and develop best practices**

- Established a Vertical Garden by reusing plastic bottles and containers which reduced plastic waste and acts as an addition to green area in the college premises.
- Every month, one day is observed as no vehicle day for college staff and students to reduce air pollution.
- Vermicomposting and compost pits are established for the management of solid waste.
- More plants have been planted in the campus for green landscaping.
- Installed 8 new color-coded dustbins at various places in the campus, one of blue and other of green colour with written information on them as biodegradable and non-biodegradable wastes for wastes segregation.
- More awareness programs have been organized to sensitize faculty and students w.r.t. environment.

Principal
S.D. College, BARNALA

# S. D. College, Barnala

## Energy Audit Report

**(2021-22)**

**Prepared By**

**Energy & Sustainable Development Committee**

S. D. College, Barnala

**Audit Date: 22 July 2022**



Principal
S.D. College, BARNALA

# Energy & Sustainable Development Committee

## S. D. College, Barnala

| Sr. No. | Name & Designation | Capacity | |
|---|---|---|---|
| 1. | Dr. Sanjay Kumar Singh<br>Department of Physics | Convenor | |
| 2. | Prof. Ashwani Sikri<br>Head, Department of Mathematics | Co-convenor | |
| 3. | Prof. Ashutosh Dharni<br>Head, Department of Computer | Member | |
| 4. | Prof. Satpal Singh<br>Department of English | Member | |
| 5. | Prof. Gurkeert Singh<br>Department of Mathematics | Member | |

Principal
S.D. College, BARNALA

# ENERGY AUDIT

# CERTIFICATE

This is to certify that an **"Energy Audit"** (Session 2021-22) for S. D. College, Barnala has been conducted in July 2022 to assess energy costs, availability and reliability of supply of energy, energy conservation technologies and ways to reduce energy consumption.

**Place:** Barnala

**Date:** 22 July 2022

Dr. Sanjay Kumar Singh

**Convenor**

Prof. Ashwani Sikri

**Co-convenor**



Principal
S.D. College, BARNALA

## Preface

The energy audit of the S. D. College, Barnala was conducted by Energy & Sustainable Development Committee for the Session 2021-22. This audit was designed to inquire energy proficiency of the college. This auditing was aimed at to recognize predominantly the electricity appliances which will consume less energy. The energy data of the institute was thoroughly studied by Energy & Sustainable Development Committee. The data was collected from whole college building including classrooms, laboratories, library, staffroom etc. The report has been completed by counting electronic and electrical appliances like LED bulbs & tubes, fans, CFL bulbs, tube lights, flood-lights, air conditioners, computers, UPS etc. used in the college.



Principal
S.D. College, BARNALA

## Acknowledgement

We are very much thankful to Dr. Rama Sharma, Principal and Dr. Rajesh Gupta, Co-ordinator (IQAC & NAAC) for motivating us for energy audit. We are also thankful to teaching and non–teaching staff members for their cooperation while collecting the data. We would also like to express our sincere thanks to Sh. Jaswinder Singh, the electrician and Sh. Jagtar Singh, JLA, Department of Physics who have assisted us a lot in this project.



Principal
S.D. College, BARNALA

## 1. Brief History about the college

- **Name of the College: S. D. College, Barnala-148101, Punjab**
- **Campus Area: 6.2 Acre**
- **Build up area: 3. 5 Acre (Approx)**
- **Year of establishment: 1956**

S.D. College, run by S.D. College Educational Society (Regd.), Barnala, are amongst the prestigious Institutions in the region in the service of Quality Education for the last 66 years. S.D. College have made incredible progress under the guidance of the founder President Dr. Raghubir Parkash, the founder member Pandit Anand Sarup and all other members who have worked with a synchronized approach towards the establishment of this college. The foundation of S.D. College (originally an Arts college) was laid by Dr. Raghubir Parkash in 1956. From its very outset, the college has been making strides in terms of academic and infrastructural up gradation. It has become a multi-faculty institution at present to meet the challenges of the changing times. Other faculties have been incorporated into the institution as Science faculty was started in 1962, Commerce faculty in 1974, to create a solid base of the literate population. To cater to the professional needs of people from Barnala and adjoining rural areas, some Technical and Professional programs like B.C.A., B.B.A., B.Sc. (M/NM), B. Lib. & Info. Sci., M.Sc. (IT), M.Sc. (IT) Lateral Entry, M.A. (English & Punjabi), M.Sc. (Mathematics), M.Com., B.Voc (Medical Laboratory & Molecular Diagnostic Technology), B.Voc (Journalism and Mass Technology), B.Voc (Software Development), B. Voc (Health & Nutrition) have been started. S.D. College has



Principal
S.D. College, BARNALA

earned a distinctive place in the educational arena with the laudable achievements of our students in the academic as well as co-curricular activities. S.D. College Barnala has carved a niche for itself in the field of education in this Malwa region. It has been constant endeavour on the part of the college to shape the young minds to think & dream big, for we believe that a man dreams are an index to his greatness.

## 2. Introduction

Electrical energy is considered a major contribution towards the economic development of a country. The main goal of energy audit is to compose balance between the energy facilities and available sources without compromising the efficiency by preferring high efficiency equipment with less consumption. The energy audit has been done by observing all the electricity demands, supply and consumption of the present working status of all fans, air conditioners, computers and other electrical equipments in the departments, offices, library and laboratories. Our team has studied one-year expenses and economic investment of electricity. This study is fully based on collected data from the college which includes necessary plans and recommendation to improve and save electricity load along with essentially energy utilization analysis to minimize environmental effects. We hope that this report will help to bring better management of energy consumption of the college to the lowest possible level.

## 3. Energy Audit

An energy audit inspects an Institutional building's energy usage to help identify the factors that drive up energy consumption. Information gathered through the inspection is used as a basis for presented recommendations to cut down energy

costs. An energy audit involves a thorough walk-through inspection by energy & sustainable development committee who will provide a report of their findings and recommendations to improve energy efficiency.

### 3.1. Data Collection

All required data is collected by counting electronic and electrical appliances like LED bulbs & tubes, fans, CFLs, tube lights, flood-lights, air conditioners, computers, UPS etc. which we are using in the college.

## Total Power Requirement for Various Equipments (from 10th May to 10th June 2021)

| Sr.No. | Items | Electric power (Watt) | Quantity | Daily uses (In hours) | Per Month (Watt) | Unit | Cost in a month |
|---|---|---|---|---|---|---|---|
| 1 | Fan | 75 | 449 | 3 | 2525625 | 2525.63 | 13562.606 |
| 2 | LED Tube | 25 | 252 | 2.5 | 393750 | 393.75 | 2114.4375 |
| 3 | LED Bulb | 12 | 66 | 2.5 | 49500 | 49.5 | 265.815 |
| 4 | CFL | 30 | 33 | 2 | 49500 | 49.5 | 265.815 |
| 5 | AC(1.5T) | 2000 | 20 | 2.5 | 2500000 | 2500 | 13425 |
| 6 | Duct AC | 12900 | 1 | 2.5 | 806250 | 806.25 | 4329.5625 |
| 7 | Fridge | 300 | 10 | 6 | 450000 | 450 | 2416.5 |
| 8 | Computer | 200 | 124 | 2.5 | 1550000 | 1550 | 8323.5 |
| 9 | Microwave | 1400 | 6 | 1 | 210000 | 210 | 1127.7 |
| 10 | Projector | 250 | 8 | 1 | 50000 | 50 | 268.5 |
| 11 | Geezers | 2000 | 1 | 0 | 0 | 0 | 0 |
| 12 | Tube set | 40 | 145 | 2 | 290000 | 290 | 1557.3 |
| 13 | Water cooler | 1000 | 4 | 5 | 500000 | 500 | 2685 |
| 14 | Motor(Pump) | 100 | 1 | 1 | 2500 | 2.5 | 13.425 |
| 15 | Patiz Machine | 200 | 1 | 3 | 15000 | 15 | 80.55 |
| 16 | Inverter | 1500 | 4 | 3 | 450000 | 450 | 2416.5 |
| 17 | TV | 50 | 3 | 2 | 7500 | 7.5 | 40.275 |



Principal
S.D. College, BARNALA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 18 | Modem | 12 | 15 | 24 | 108000 | 108 | 579.96 |
| 19 | Photostat machine | 900 | 2 | 1 | 45000 | 45 | 241.65 |
| 20 | UPS | 150 | 3 | 0.5 | 5625 | 5.625 | 30.20625 |
| 21 | UPS (B.Voc MLMDT) | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| 22 | UPS (B.Voc soft Devt.) | 1000 | 1 | 0.5 | 12500 | 12.5 | 67.125 |
| 23 | UPS(Computer Lab1) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| 24 | UPS(Computer Lab2) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| 25 | UPS (Library) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| 26 | UPS (Admin Block) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| 27 | Exhaust Fan (Large) | 250 | 2 | 3 | 37500 | 37.5 | 201.375 |
| 28 | Exhaust Fan(Small) | 50 | 32 | 4 | 160000 | 160 | 859.2 |
| 29 | Oil heater | 3000 | 1 | 0 | 0 | 0 | 0 |
| 30 | Blower | 2000 | 1 | 0 | 0 | 0 | 0 |
| 31 | Electric kettle | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| 32 | Camera | 50 | 25 | 24 | 750000 | 750 | 4027.5 |
| 33 | RO Plant | 8000 | 1 | 6 | 1200000 | 1200 | 6444 |
| 34 | Flood Light | 50 | 12 | 10 | 150000 | 150 | 805.5 |
| 35 | Currency Machine | 80 | 1 | 2 | 4000 | 4 | 21.48 |
| 36 | Barcode Printer | 70 | 1 | 0.2 | 350 | 0.35 | 1.8795 |
| 37 | Internet Server | 50 | 4 | 24 | 120000 | 120 | 644.4 |
| 38 | S.D College Nameplate | 400 | 1 | 8 | 80000 | 80 | 429.6 |
| 39 | Farata Fan | 250 | 1 | 2 | 12500 | 12.5 | 67.125 |
| 40 | Laptop | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| 41 | Blower Cleaning | 700 | 1 | 0.1 | 1750 | 1.75 | 9.3975 |
| 42 | Vacuum Cleaner | 1400 | 1 | 0.1 | 3500 | 3.5 | 18.795 |
| 43 | Printer | 400 | 22 | 1 | 220000 | 220 | 1181.4 |
| 44 | Washing Machine | 2000 | 1 | 0.2 | 10000 | 10 | 53.7 |
| 45 | Cooler | 250 | 3 | 8 | 150000 | 150 | 805.5 |
| 46 | Smart Board | 150 | 1 | 2 | 7500 | 7.5 | 40.275 |
| 47 | Audio Deck | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| 48 | Vendego Machine | 50 | 1 | 0.1 | 125 | 0.125 | 0.67125 |
| | | | | | | Total (Rs) | 70953.676 |



Principal
S.D. College, BARNALA

| Power Consumptions from Electricity Board (PSPCL) (Account Numbers 3002944859 & 3002941984 ) | | | |
|---|---|---|---|
| **Sr. No.** | **Month** | **Consumption Unit (KWH/KVAH)** | **Total Amount (Rs)** |
| **1** | **10 May to 10 June 2020** | 4042 | 41450 |
| **2** | **10 June to 10 July 2020** | 7153 | 66870 |
| **3** | **10 July to 10 August 2020** | 10882 | 98300 |
| **4** | **10 August to 10 September 2020** | 12610 | 112520 |
| **5** | **10 September to 10 October 2020** | 9313 | 90490 |
| **6** | **10 October to 10 November 2020** | 5892 | 58110 |
| **7** | **10 November to 10 December 2020** | 3554 | 40090 |
| **8** | **10 December to 10 January 2021** | 3727 | 40780 |
| **9** | **10 January to 10 February 2021** | 3559 | 39780 |
| **10** | **10 February to 10 March 2021** | 3579 | 38350 |
| **11** | **10 March to 10 April 2021** | 4365 | 45430 |
| **12** | **10 April to 10 May 2021** | 8249 | 72880 |
| **Total** | | 76925 | 745050 |

**Total consumption of three accounts for 12 Months=94791 (KWH/KVAH)**

**Total consumption of three accounts for One Month=7899.25(KWH/KVAH)**

| **S.No.** | **Month** | **Solar System Units** | **Amount (Rs)** |
|---|---|---|---|
| **1** | **31 May to 30 June 2021** | 1976 | 5100 |
| **2** | **30 June to 26 July 2021** | 2261 | 4820 |
| **3** | **26 July to 30 Sept 2021** | 4181 | 24300 |
| **4** | **30 Sept to 29 Nov 2021** | 2032 | 18410 |
| **5** | **29 Nov to 27 Dec 2021** | 1076 | 4744 |
| **6** | **27 Dec to 27 January 2022** | 693 | 5690 |
| **7** | **27 Jan to 26 feb 2022** | 1161 | 8790 |
| **8** | **26 Feb to 28 March** | 1568 | 11970 |
| **9** | **28 March to 27 april 2022** | 930 | 15780 |
| **10** | **27 April to 27 May 2022** | 1988 | 24620 |
| **Total** | | 17866 | 1,24,224 |



Principal
S.D. College, BARNALA

| Power through Solar PLANT<br>Account Numbers 3002944861 | | |
|---|---|---|
| **S. No.** | **Month** | **Solar System Units** |
| **1** | **31 May to 30 June 2021** | 1976 |
| **2** | **30 June to 26 July 2021** | 2261 |
| **3** | **26 July to 30 September 2021** | 4181 |
| **4** | **30 September to 29 November 2021** | 2032 |
| **5** | **29 November to 27 December 2021** | 1076 |
| **6** | **27 December to 27 January 2022** | 693 |
| **7** | **27 January to 26 February 2022** | 1161 |
| **8** | **26 February to 28 March 2022** | 1568 |
| **9** | **28 March to 27 April 2022** | 930 |
| **10** | **27 April to 27 May 2022** | 1988 |
| | **Total** | 17866 |
| | **Average Unit Per day** | 48.95 |

**Total number of units of power produced through solar power plant are 48.95 units per day i.e. 17866 units in a year which were 18.85% of the total power consumption (94791 units) of the college.**

**Also during the power cuts, college manages the electricity through two generators of power capacity 15 KW and 20 KW.**

**As per the recommendations of previous year's Energy Audit Report, the curtains got fitted in offices and Labs, HRC switches were installed and earthing was done for saving electricity.**

## 4. Recommendations

On the basis of the data analysis, energy & sustainable development committee recommends the following steps for reducing power consumption



Principal
S.D. College, BARNALA

- **Use of LED bulbs**
- **Use of curtains in AC rooms**
- **Use of reflectors for utilizing the Sun light**
- **Use of department wise main On/off switch.**
- **Use of HRC switch and MCV switches.**
- **Installations of more Solar Plant.**
- **Use of energy efficient devices with high stars.**
- **Use of solar cell Street light.**
- **Use of Motion Sensors in toilets.**
- **Replacement of Heater with LPG cylinder in labs.**
- **Use of Main filter for RO in place of multiple filters**
- **Use of waste water of R.O in toilets so that electricity can be saved for filling the water tanks.**
- **Fall ceiling in A.C rooms & Use of Computers in power saving mode.**

## 5. Results and discussion:

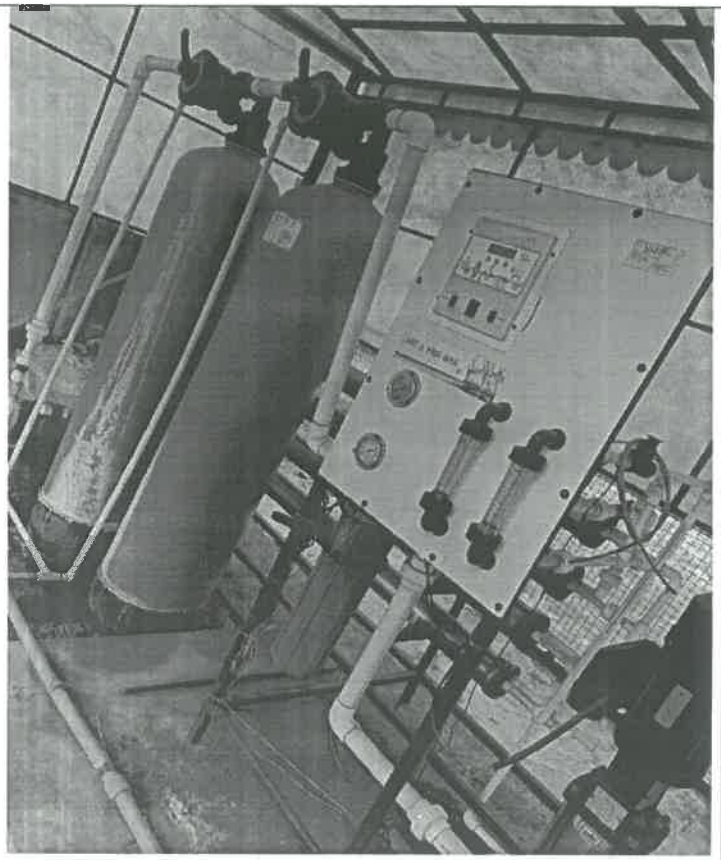
Energy audit is the main concern regarding educational institution. We have collected data by considering the LED bulbs & tubes, fans, CFL bulbs, tube lights, flood-lights, air conditioners, computers, UPS etc. Average energy Consumption through all devices is **7899.25 Unit /Month.**

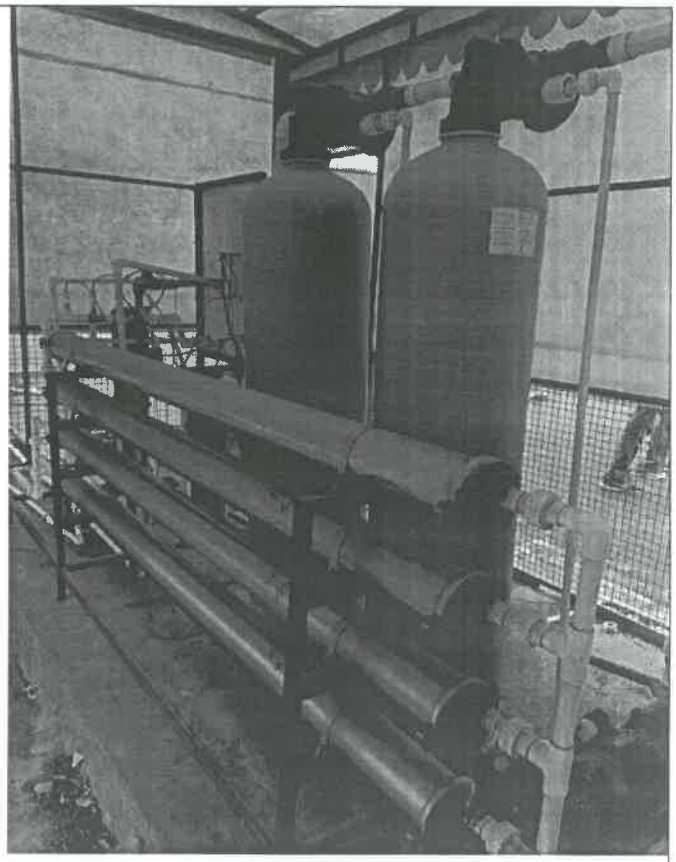
## 6. Conclusion

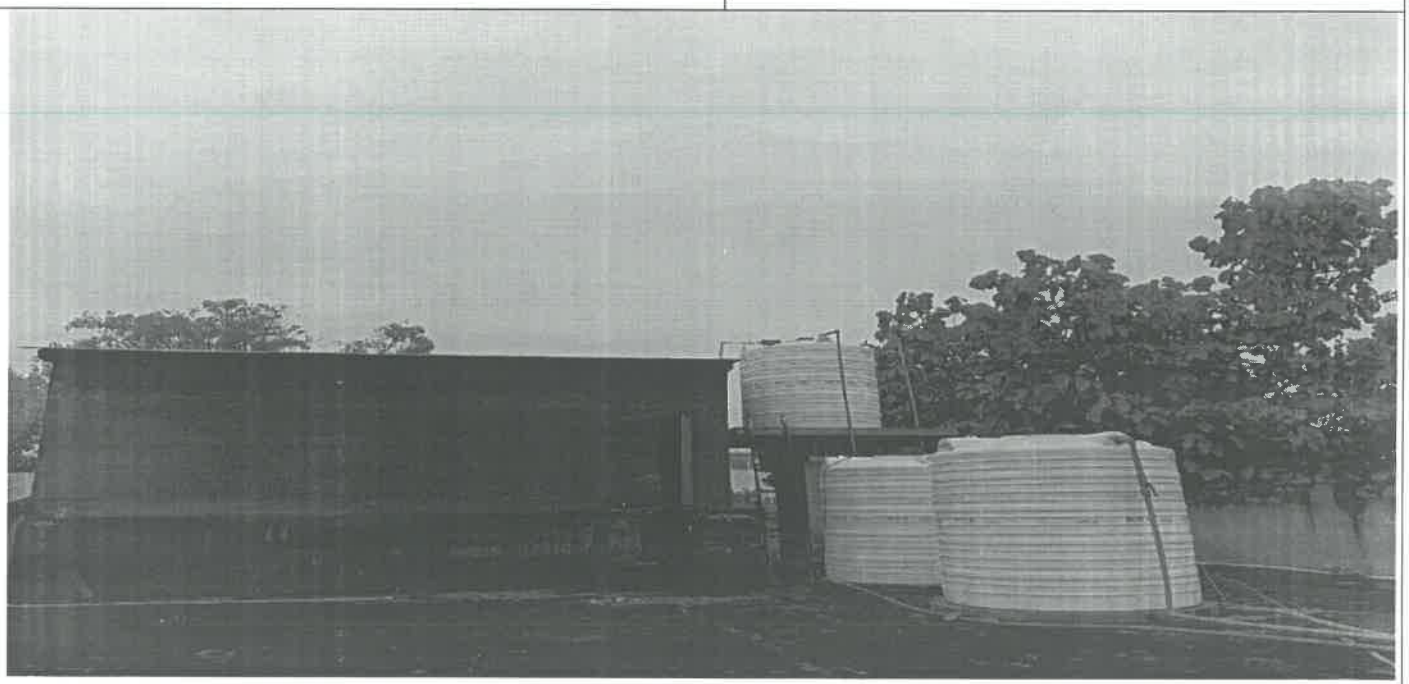
The Energy audit gives a positive direction to the energy cost reduction and preventive maintenance. The data generated in energy audit is useful to understand the energy distribution and utilization in the college. The college needs maximum of **7899.25** units/month of electricity.



Principal
S.D. College, BARNALA



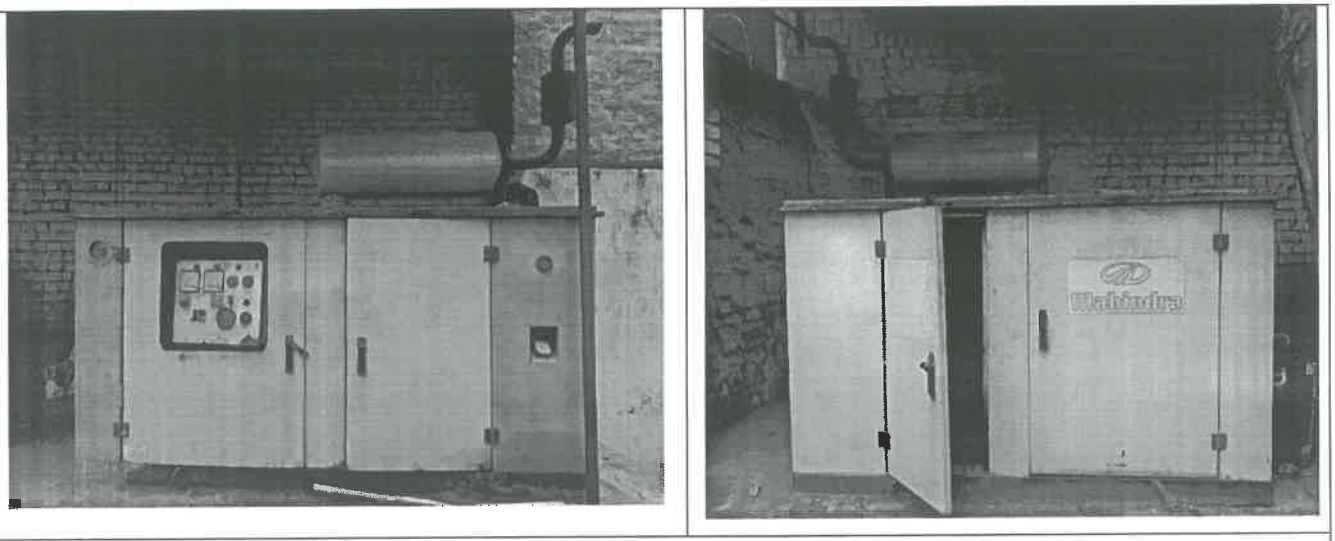




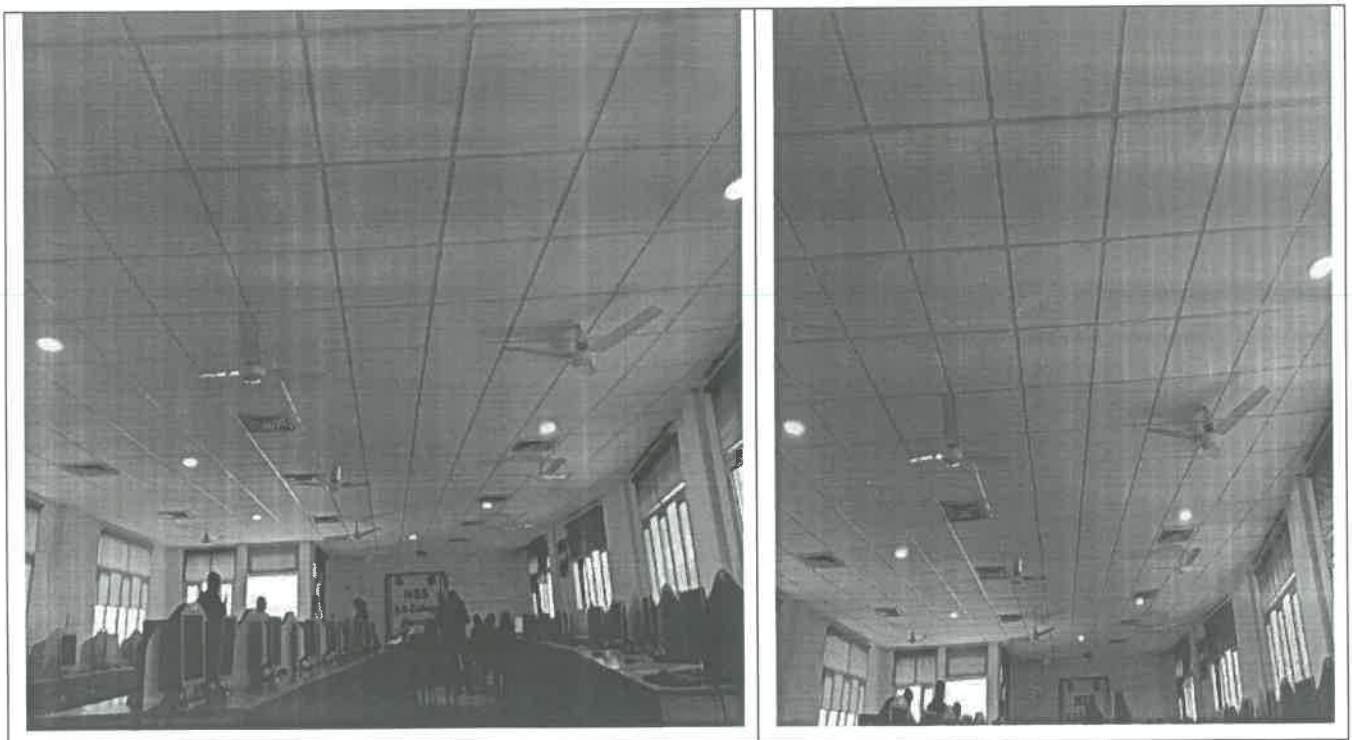
**Centralised R. O. Plant in the College**



Principal
S.D. College, BARNALA



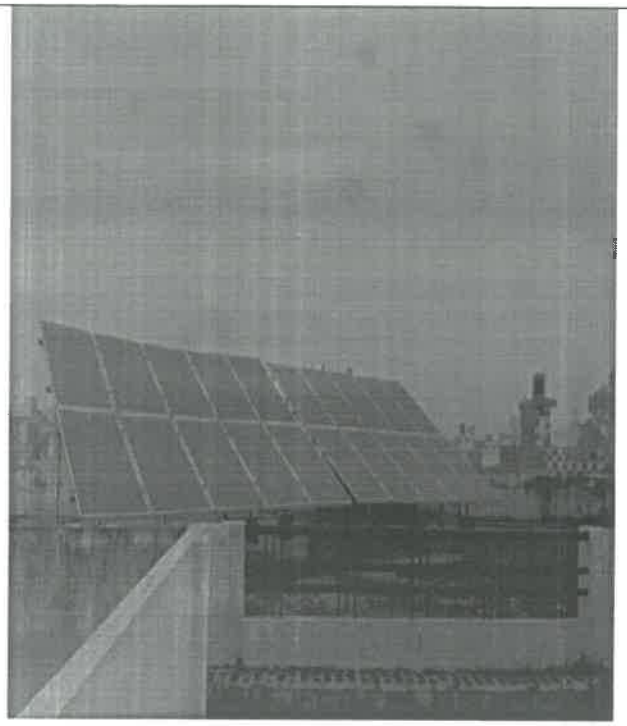
**Diesel Generator (15KW+20KW) in the College**

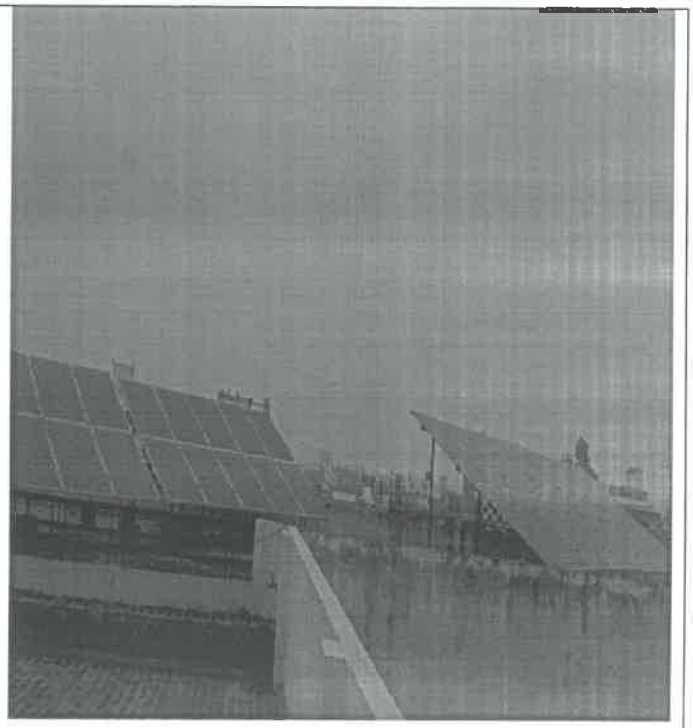


**Use of LEDs in Computer Lab 1**

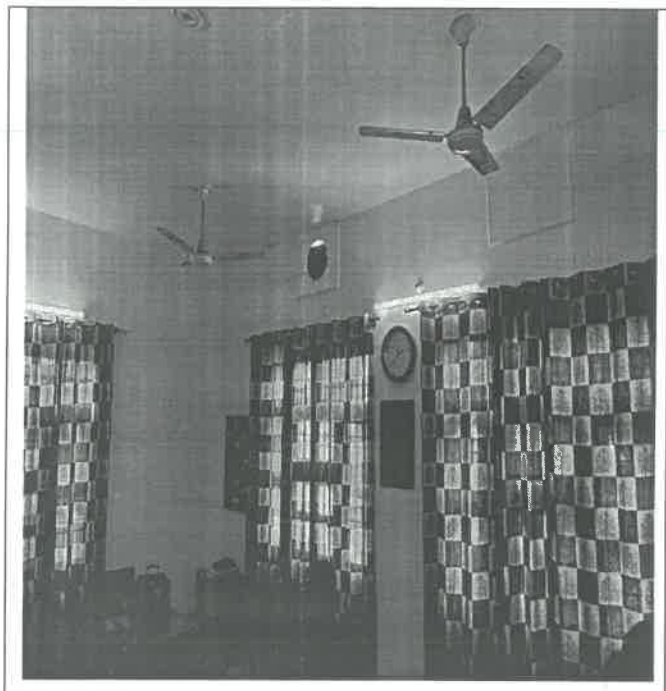


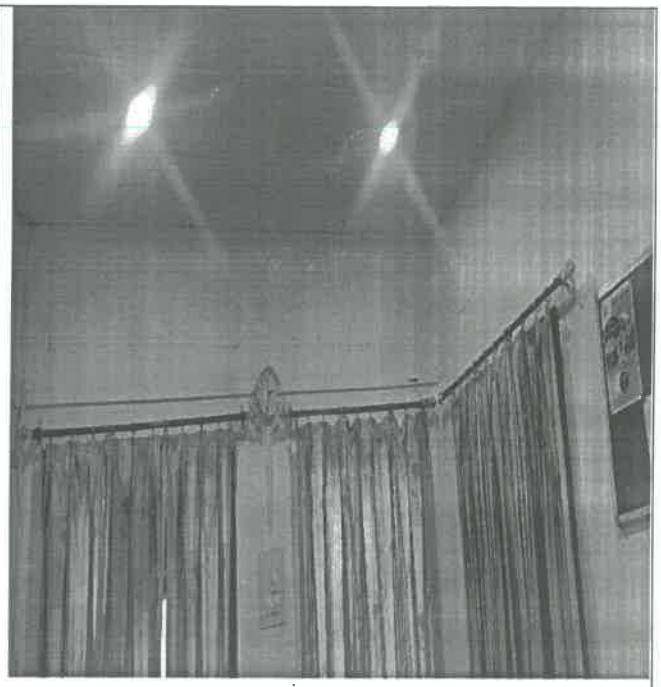
Principal
S.D. College, BARNALA





**Solar Power Plant in the College**

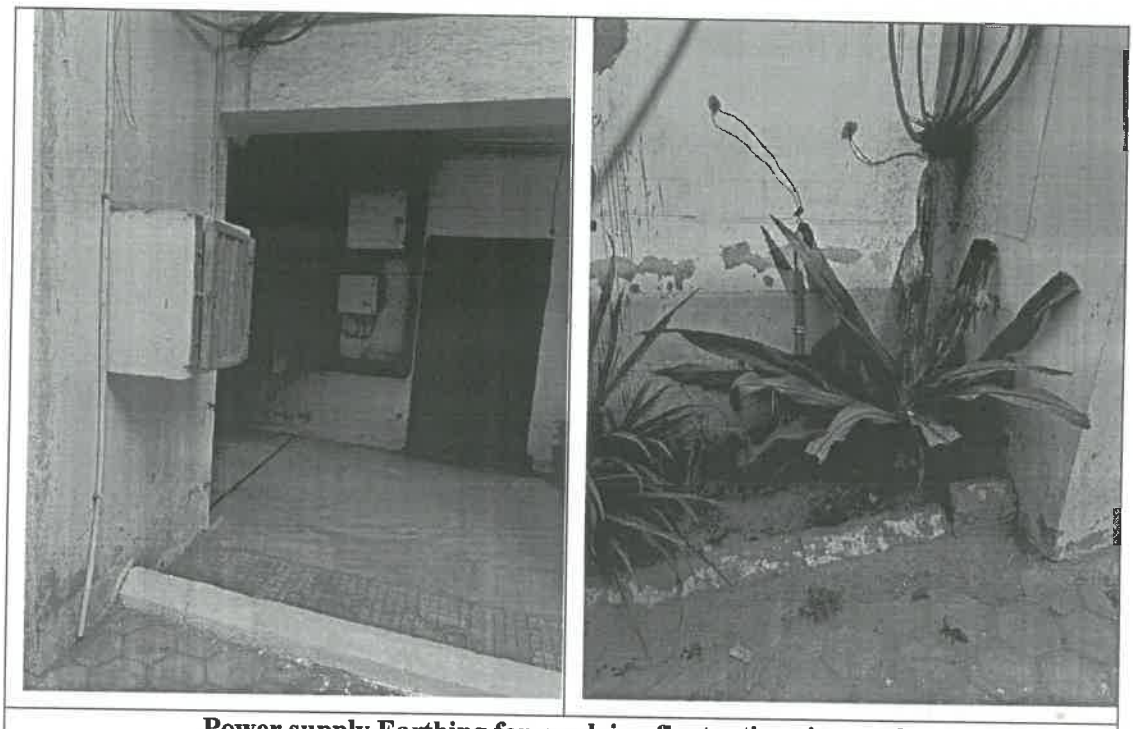




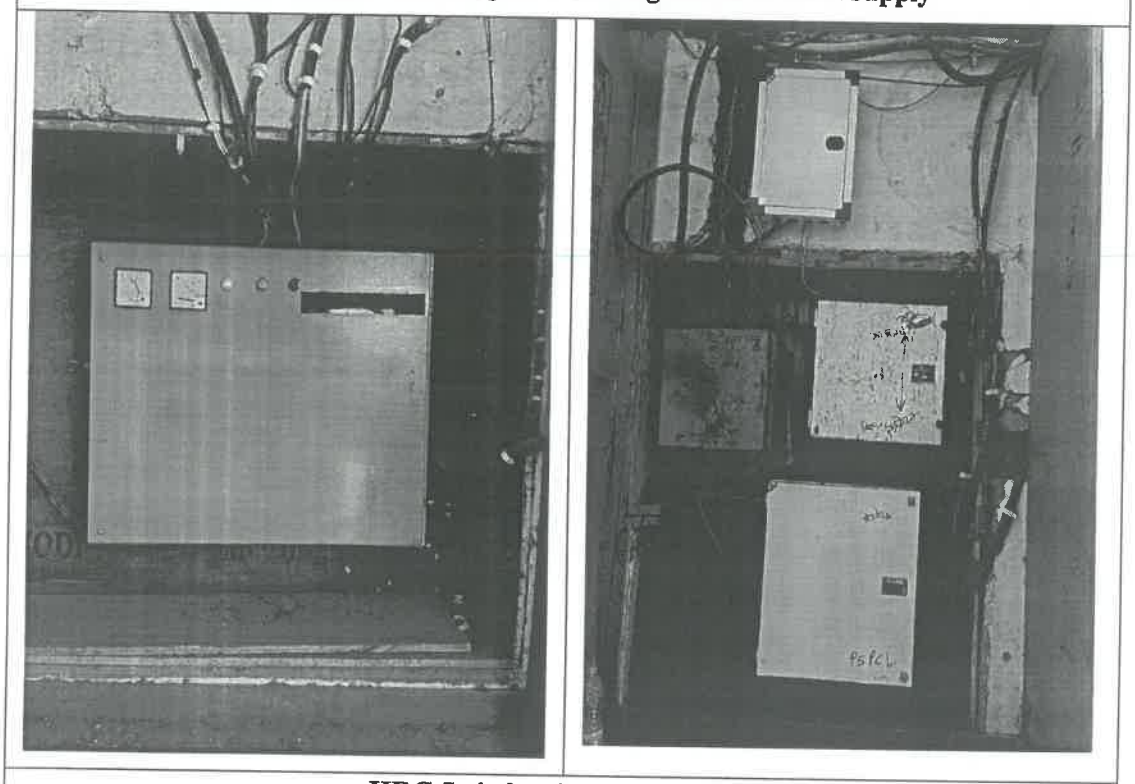
**Curtains fitted in offices**



Principal
S.D. College, BARNALA



**Power supply Earthing for resolving fluctuations in supply**



**HRC Switches fitted in College.**



Principal
S.D. College, BARNALA

**Curtains fitted in Goswami Ganesh Dutt Innovation Hub, Department of Physics**



Principal
S.D. College, BARNALA

# S. D. College, Barnala

## Action Taken Energy & Sustainable Development Report (Session 2021-2022)

**S. D. College, Barnala is committed to maximize energy conservation procedures through various measures.**

[1] All the computer monitors have been replaced with TFT. Screen savers facility implemented for every computer.

[2] Installed centralised R. O. system to save energy.

[3] College is using waste water of R.O system to fill the water tanks for flushing in washrooms.

[4] Many existing conventional lighting system has been replaced with the LED.

[5] Natural light is optimally used & walls are painted with off white colour to have sufficient brightness in all the rooms.

[6] Energy needs of the campus are maintained with back-up power supply system supplying uninterrupted energy.

[7] Energy efficient utilization measures are being taken in the supply, demand systems as part of energy management of the campus.

[8] Electricity bills are continuously monitored for the efficient utilization of solar power plant installed in the campus.

[9] The staff members and students lead initiatives to save significant electricity and have developed a policy for reducing electricity consumption.

[10] Directions are given to students for the proper utilization of the electronic devices in the institution to ensure that all the devices are turned off when not in use.

[11] Replacement of some old appliances with energy-efficient appliances is underway.

[12] Use of LED bulbs, Use of curtains in AC rooms, Use of HRC switch and MCV switches have been advocated.

[13] Energy efficient devices with high stars are being used.

[14] Heaters are replaced with LPG cylinder in labs.

[15] Waste water of R.O. system is being used in washroom for flushing so that electricity/water can be saved.

Principal
S.D. College, BARNALA

# S. D. College, Barnala

## Energy Audit Report

(2020-21)

**Prepared By**

**Energy & Sustainable Development Committee**

S. D. College, Barnala

**Audit Date: 22 July 2021**



Principal
S.D. College, BARNALA

# Energy & Sustainable Development Committee

## S. D. College, Barnala

| Sr. No. | Name & Designation | Capacity | |
|---|---|---|---|
| 1. | Dr. Sanjay Kumar Singh<br>Department of Physics | Convenor | |
| 2. | Prof. Ashwani Sikri<br>Head, Department of Mathematics | Co-convenor | |
| 3. | Prof. Ashutosh Dharni<br>Head, Department of Computer | Member | |
| 4. | Prof. Satpal Singh<br>Department of English | Member | |
| 5. | Prof. Gurkeert Singh<br>Department of Mathematics | Member | |



Principal
S.D. College, BARNALA

# ENERGY AUDIT

# CERTIFICATE

This is to certify that an **"Energy Audit"** (Session 2020-21) for S. D. College, Barnala has been conducted in July 2021 to assess energy costs, availability and reliability of supply of energy, energy conservation technologies and ways to reduce energy consumption.

**Place:** Barnala

**Date:** 22 July 2021

Dr. Sanjay Kumar Singh

**Convenor**

Prof. Ashwani Sikri

**Co-convenor**



Principal
S.D. College, BARNALA

## Preface

The energy audit of the S. D. College, Barnala was conducted by energy & sustainable development committee for the Session 2020-21. This audit was designed to inquire energy proficiency of the college. This auditing was aimed at to recognize predominantly the electricity appliances which will consume less energy. The energy data of the institute was thoroughly studied by energy & sustainable development committee. The data was collected from whole college building including classrooms, laboratories, library, staffroom etc. The report has been completed by counting electronic and electrical appliances like LED bulbs & tubes, fans, CFL bulbs, tube lights, flood-lights, air conditioners, computers, UPS etc. used in the college.



Principal
S.D. College, BARNALA

## Acknowledgement

We are very much thankful to Dr. Rama Sharma, Principal and Dr. Rajesh Gupta, Co-ordinator (IQAC & NAAC) for motivating us for energy audit. We are also thankful to teaching and non–teaching staff members for their cooperation while collecting the data. We would also like to express our sincere thanks to Sh. Jaswinder Singh, the electrician and Sh. Jagtar Singh, JLA, Department of Physics who have assisted us a lot in this project.

## 1. Introduction

Electrical energy is considered a major contribution towards the economic development of a country. The main goal of energy audit is to compose balance between the energy facilities and available sources without compromising the efficiency by preferring high efficiency equipment with less consumption. The energy audit has been done by observing all the electricity demands, supply and consumption of the present working status of all fans, air conditioners, computers and other electrical equipments in the departments, offices, library, laboratories. Our team has studied one-year expenses and economic investment of electricity. This study is fully based on collected data from the college which includes necessary plans and recommendation to improve and save electricity load along with essentially energy utilization analysis to minimize environmental effects. We hope that this report will help to bring better management of energy consumption of the college to the lowest possible level.

## 2. Energy Audit

An energy audit inspects an Institutional building's energy usage to help identify the factors that drive up energy consumption. Information gathered through the inspection is used as a basis for presented recommendations to cut down energy costs. An energy audit involves a thorough walk-through inspection by energy & sustainable development committee who will provide a report of their findings and recommendations to improve energy efficiency.

### 2.1. Data Collection

All required data is collected by counting electronic and electrical appliances like LED bulbs & tubes, fans, CFLs, tube lights, flood-lights, air conditioners, computers, UPS etc. which we are using in the college.

## Total Power Requirement for Varies Equipments (from 10th May to 10th June 2020)

| Sr. No. | Items | Electric power (Watt) | Quantity | Average Daily uses (In hours) | Per Month (Watt) | Unit | Cost in a month |
|---|---|---|---|---|---|---|---|
| 1 | Fan | 75 | 435 | 3 | 2446875 | 2446.88 | 13139.719 |
| 2 | LED Tube | 25 | 250 | 3 | 468750 | 468.75 | 2517.1875 |
| 3 | LED Bulb | 12 | 64 | 3 | 57600 | 57.6 | 309.312 |
| 4 | CFL | 30 | 33 | 3 | 74250 | 74.25 | 398.7225 |
| 5 | AC(1.5T) | 2000 | 19 | 3 | 2850000 | 2850 | 15304.5 |
| 6 | Duct AC | 12900 | 1 | 4 | 1290000 | 1290 | 6927.3 |
| 7 | Fridge | 300 | 9 | 6 | 405000 | 405 | 2174.85 |
| 8 | Computer | 200 | 122 | 3 | 1830000 | 1830 | 9827.1 |
| 9 | Microwave | 1400 | 6 | 1 | 210000 | 210 | 1127.7 |
| 10 | Projector | 250 | 5 | 1 | 31250 | 31.25 | 167.8125 |
| 11 | Geezers | 2000 | 1 | 0 | 0 | 0 | 0 |
| 12 | Tube set | 40 | 145 | 3 | 435000 | 435 | 2335.95 |
| 13 | Water cooler | 1000 | 2 | 6 | 300000 | 300 | 1611 |
| 14 | Motor(Pump) | 100 | 1 | 1 | 2500 | 2.5 | 13.425 |
| 15 | Patiz Machine | 200 | 2 | 4 | 40000 | 40 | 214.8 |
| 16 | Inverter | 1500 | 4 | 6 | 900000 | 900 | 4833 |
| 17 | TV | 50 | 3 | 6 | 22500 | 22.5 | 120.825 |
| 18 | Modem | 12 | 14 | 24 | 100800 | 100.8 | 541.296 |
| 19 | Photostat machine | 900 | 2 | 1 | 45000 | 45 | 241.65 |
| 20 | UPS | 150 | 3 | 0.5 | 5625 | 5.625 | 30.20625 |
| 21 | UPS (B.Voc MLMDT) | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |



Principal
S.D. College, BARNALA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 22 | UPS (B.Voc soft Devt.) | 1000 | 1 | 0.5 | 12500 | 12.5 | 67.125 |
| 23 | UPS(Compute r Lab1) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| 24 | UPS(Compute r Lab2) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| 25 | UPS (Library) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| 26 | UPS (Admin Block) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| 27 | Exhaust Fan (Large) | 250 | 2 | 3 | 37500 | 37.5 | 201.375 |
| 28 | Exhaust Fan(Small) | 50 | 32 | 4 | 160000 | 160 | 859.2 |
| 29 | Oil heater | 3000 | 1 | 0 | 0 | 0 | 0 |
| 30 | Blower | 2000 | 1 | 0 | 0 | 0 | 0 |
| 31 | Electric kettle | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| 32 | Camera | 50 | 25 | 24 | 750000 | 750 | 4027.5 |
| 33 | RO Plant | 8000 | 1 | 6 | 1200000 | 1200 | 6444 |
| 34 | Flood Light | 50 | 12 | 10 | 150000 | 150 | 805.5 |
| 35 | Currency Machine | 80 | 1 | 2 | 4000 | 4 | 21.48 |
| 36 | Barcode Printer | 70 | 1 | 0.2 | 350 | 0.35 | 1.8795 |
| 37 | Internet Server | 50 | 4 | 24 | 120000 | 120 | 644.4 |
| 38 | S.D College Nameplate | 400 | 1 | 8 | 80000 | 80 | 429.6 |
| 39 | Farata Fan | 250 | 1 | 4 | 25000 | 25 | 134.25 |
| 40 | Laptop | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| 41 | Blower Cleaning | 700 | 1 | 0.1 | 1750 | 1.75 | 9.3975 |
| 42 | Vacuum Cleaner | 1400 | 1 | 0.1 | 3500 | 3.5 | 18.795 |
| 43 | Printer | 400 | 20 | 1 | 200000 | 200 | 1074 |
| 44 | Washing Machine | 2000 | 1 | 0.2 | 10000 | 10 | 53.7 |
| 45 | Cooler | 250 | 3 | 8 | 150000 | 150 | 805.5 |
| 46 | Smart Board | 150 | 1 | 2 | 7500 | 7.5 | 40.275 |
| 47 | Audio Deck | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| 48 | Vendego Machine | 50 | 1 | 0.1 | 125 | 0.125 | 0.67125 |
| | | | | | | Total (Rs) | 79005.454 |



Principal
S.D. College, BARNALA

| Power Consumptions from Electricity Board (PSPCL) (Account Numbers 3002944859 & 3002941984 ) | | | |
|---|---|---|---|
| Sr. No. | Month | Consumption Unit (KWH/KVAH) | Total Amount (Rs) |
| 1 | 10 May to 10 June 2020 | 4426 | 126910 |
| 2 | 10 June to 10 July 2020 | 6654 | 65690 |
| 3 | 10 July to 10 August 2020 | 8797 | 78880 |
| 4 | 10 August to 10 September 2020 | 9410 | 83810 |
| 5 | 10 September to 10 October 2020 | 11181 | 96490 |
| 6 | 10 October to 10 November 2020 | 6239 | 58449 |
| 7 | 10 November to 10 December 2020 | 4653 | 45380 |
| 8 | 10 December to 10 January 2021 | 4661 | 45460 |
| 9 | 10 January to 10 February 2021 | 4604 | 43750 |
| 10 | 10 February to 10 March 2021 | 4764 | 44140 |
| 11 | 10 March to 10 April 2021 | 4221 | 38540 |
| 12 | 10 April to 10 May 2021 | 4557 | 43490 |
| Total | | 74167(KWH/KVAH) | 770948(Rs) |

| Power Consumption of Electricity Board (PSPCL) (Account Numbers 3002944861 ) | | | |
|---|---|---|---|
| Sr. no. | Month | Total Consumption Unit (KWH/KVAH) | Total Amount (Rs) |
| 1 | 31 May to 6 August 2020 | 3039 | 11350 |
| 2 | 6 August to 30 September 2020 | 5396 | 9310 |
| 3 | 30 September to 18 November 2020 | 3060 | 13640 |
| 4 | 18 November 2020 to 30 January 2021 | 3620 | 12840 |
| 5 | 30 January to 28 February 2021 | 1319 | 4903 |
| 6 | 28 February to 31 March 2021 | 1564 | 5300 |
| 7 | 1 April to 30 April 2021 | 1505 | 5262 |
| 8 | 30 April to 31 May 2021 | 1743 | 5438 |
| | Total | 21246(KWH/KVAH) | 68043(Rs.) |

**Total consumption of three accounts for 12 Months=95413 (KWH/KVAH)**

**Total consumption of three accounts for One Month=7951.08(KWH/KVAH)**

Principal
S.D. College, BARNALA

| Power through SOLAR PLANT | | |
|---|---|---|
| Sr. no. | Month | Solar System Units |
| 1 | 31 May to 6 August 2020 | 3533 |
| 2 | 6 August to 30 September 2020 | 4002 |
| 3 | 30 September to 18 November 2020 | 2390 |
| 4 | 18 November 2020 to 30 January 2021 | 3558 |
| 5 | 30 January to 28 February 2021 | 1997 |
| 6 | 28 February to 31 March 2021 | 1700 |
| 7 | 1 April to 30 April 2021 | 1900 |
| 8 | 30 April to 31 May 2021 | 2057 |
| | Total | 21137 |
| | Average Unit per day | 57.91 |

**Total number of units of power produced through solar power plant are 57.91 units per day i.e. 21137.15 units in a year which were 22.15% of the total power consumption (95413 units) of the college.**

**Also during the power cuts, college manages the electricity through two generators of power capacity 15 KW and 20 KW.**

## 3. Recommendations

On the basis of the data analysis, energy & sustainable development committee recommends the following steps for reducing power consumption

- **Use of LED bulbs**
- **Use of curtains in AC rooms**
- **Use of reflectors for utilizing the Sun light**
- **Use of department wise main On/off switch.**
- **Use of HRC switch and MCV switches.**
- **Installations of more Solar Plant.**
- **Use of energy efficient devices with high stars.**
- **Use of solar cell Street light.**
- **Use of Motion Sensors in toilets.**

Principal
S.D. College, BARNALA

- **Replacement of Heater with LPG cylinder in labs.**
- **Use of Main filter for RO in place of multiple filters**
- **Use of waste water of R.O in toilets so that electricity can be saved for filling the water tanks.**
- **Fall ceiling in A.C rooms & Use of Computers in power saving mode.**

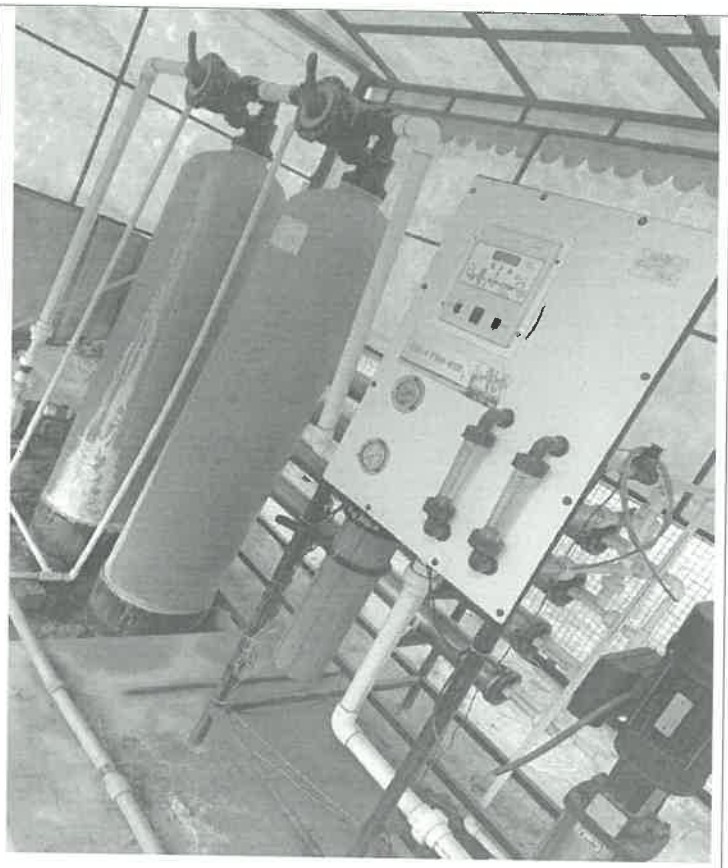
## 4. Results and discussion:

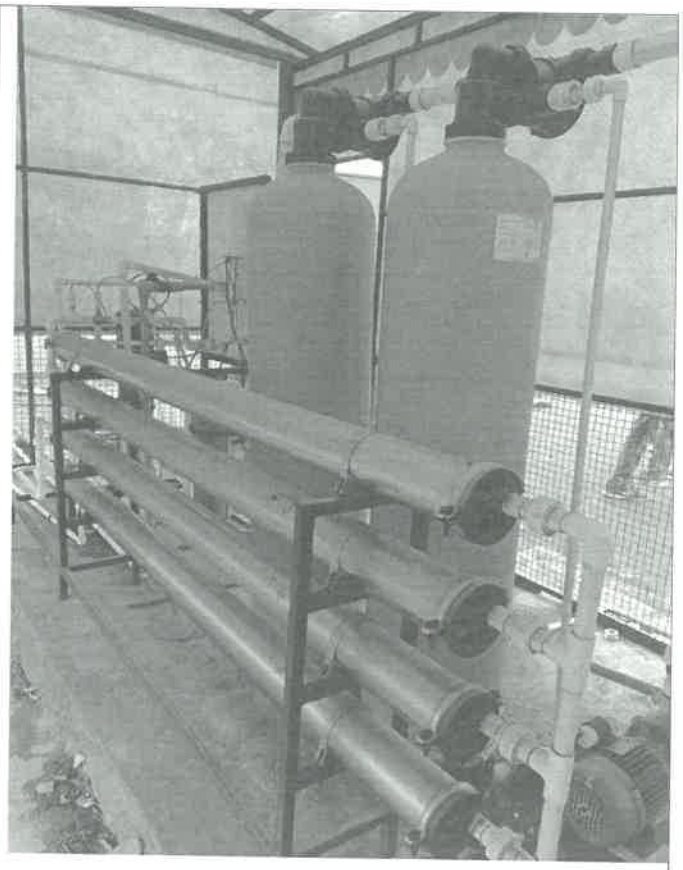
Energy audit is the main concern regarding educational institution. We have collected data by considering the LED bulbs & tubes, fans, CFL bulbs, tube lights, flood-lights, air conditioners, computers, UPS etc. Average energy Consumption through all devices is **7951.08 Unit /Month.**

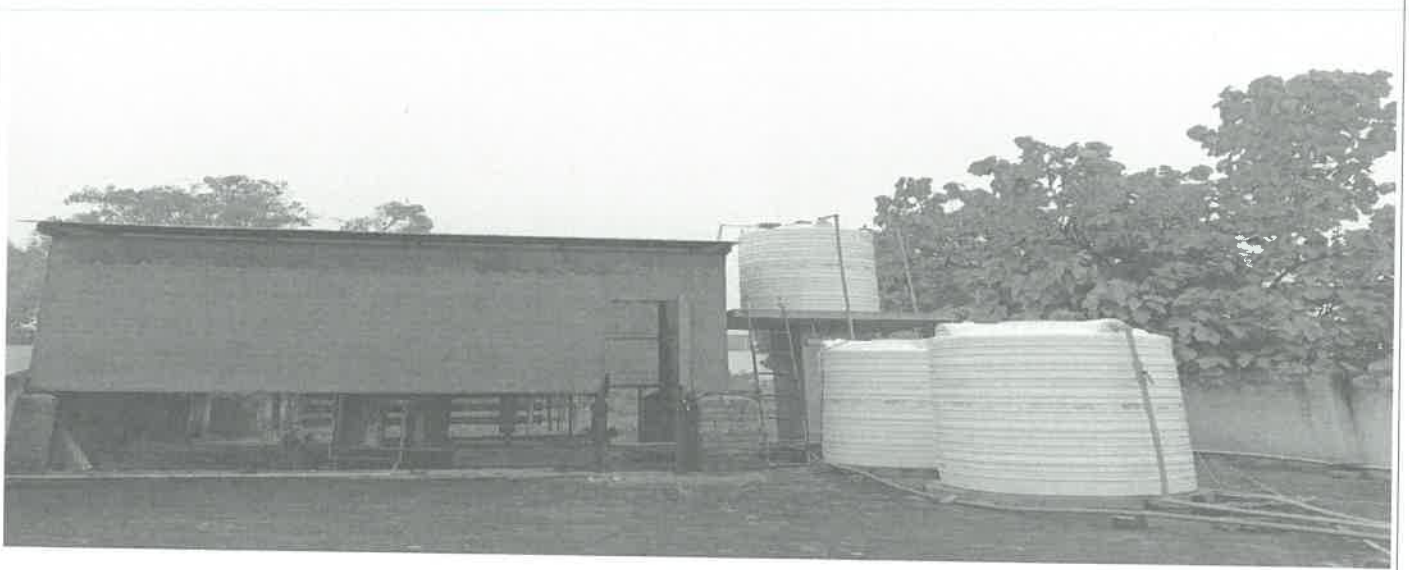
## 5. Conclusion

The Energy audit gives a positive direction to the energy cost reduction and preventive maintenance. The data generated in energy audit is useful to understand the energy distribution and utilization in the college. The college needs maximum of **7951.08** units/month of electricity.

Principal
S.D. College, BARNALA

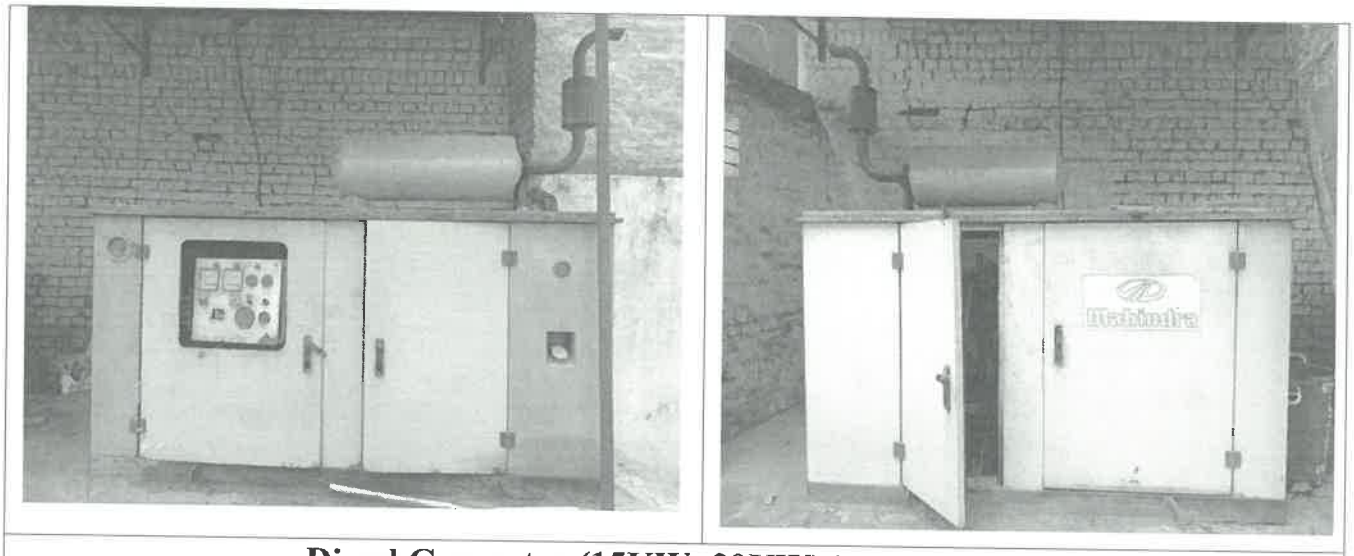






**Centralised R. O. Plant in the College**

Principal
S.D. College, BARNALA



**Diesel Generator (15KW+20KW) in the College**

**Use of LEDs in Computer Lab 1**

Principal
S.D. College, BARNALA

**Solar Power Plant in the College**

Rama Sharma

Digitally signed by Rama Sharma
Date: 2023.11.04 14:09:50 +05'30'

Principal S D
College Barnala

Principal
S.D. College, BARNALA

# *ENVIRONMENT AUDIT REPORT*

## Session: 2022-23


**Prepared By**
**CAMPUS ENVIRONMENT COMMITTEE**
**S.D. College, Barnala, Punjab (India)**
**(Established in 1956)**
**(Affiliated to Punjabi University, Patiala)**
**(Under UGC Act 2f & 12b)**
**(NAAC Accredited)**
**(Grant in aid from Punjab Govt.)**
**Website: http://sdcollegeinstitutions.org**

**Audit Date: 29 July 2023**



Principal
S.D. College, BARNALA

## CAMPUS ENVIRONMENT COMMITTEE

### S. D. College, Barnala

| Sr. No. | Name & Designation | Capacity | |
|---|---|---|---|
| 1. | Dr. Reetu Aggarwal<br>Associate Professor in English | Convener | Reetu Aggarwal |
| 2. | Dr. Manish Kumar<br>Assistant Professor in Botany | Co-convener | Manish Kumar |
| 3. | Dr. Sanjay Kumar Singh<br>Assistant Professor in Physics | Member | Singh |
| 4. | Mr. Satpal Singh<br>Assistant Professor in English | Member | Satpal Singh |

Principal
S.D. College, BARNALA
Reetu

## CERTIFICATE

This is to certify that an **"Environment Audit"** (Session 2022-23) for S.D. College, Barnala has been conducted in July 2023 to assess to green practises followed by the college and to determine where we stand on an environmental soundness scale.

**Place:** Barnala

**Date:** 27 July 2023

Dr. Reetu Aggarwal

**Convener**

Dr. Manish Kumar

**Co-convener**

Principal
S.D. College, BARNALA

## Environmental Background

S.D. College, Barnala, one of the most well-known colleges in the Malwa region of Punjab, has significantly improved education and raised students' understanding of a wide range of social concerns. Our college has focused on the environment because it is currently the topic of discussion for all other issues. The 6.2 acres that make up the college are home to a sports field, a botanical garden, an NSS park, and a temple open space. The best part of the college is that it is located in residential area that facilitates the students' easy accessibility to it.

Because of its proximity to a bus stop and the railway station, students from all around may get there by bus and train. Its location in an urban area hasn't affected its green belt, though. On the other hand, the verdant lawns, sports fields, and residual green space have proven to be a boon in terms of minimizing air and noise pollution on campus and in the surrounding area. The campus also has a vermicomposting plant, solar panels, rainwater collecting systems, and a variety of academic buildings. In an effort to reduce water waste, the college is utilizing RO discharged water in toilet systems and for landscaping.

The main objectives of Environmental audit are to

- **Develop environmental management strategies based on comprehensive investigations.**
- **Increase efficient and cost-effective resource management, which reduces costs and encourages sustainability.**
- **Benchmarking for environmental protection initiatives**
- **Creating an environmental ethical and value system among staff and students.**
- **To provide a report that documents baseline data of excellent practices and provides ideas and action plans for future environmental quality improvement.**

This Environment Audit Report relies on a study of the findings of energy, green, and e-waste audits, a desktop examination of records, a visit of the College campus, and interactions with teaching and non-teaching personnel, as well as students. The Environment Audit Report summarizes the College's overall environmental state as well as efforts taken to improve environmental sustainability. Furthermore, it makes suggestions and recommendations for enhancing environmental sustainability.

**Observations and Recommendations of Campus Environment Committee include:**

1. **Water Efficiency and Rain Water Harvesting**
2. **Solid Waste Management**
3. **Energy conservation and Efficiency**
4. **e-Waste Management**
5. **Environmental Sustainability Enhancement**



Principal
S.D. College, BARNALA

## 1. Water Efficiency and Rain Water Harvesting:

The majority of the college's water supply comes from boreholes and taps that are connected to the Barnala Municipal Committee. The same water is utilised in the RO System for drinking as well as for other tasks like cleaning, gardening, etc. In 2022, a total of 46,45,000 litres of water is filtered with RO system for drinking purposes. The Green Audit Report estimates that approximately 27,87,000 litres of water is lost throughout the filtration process. For efficient water management and to cut down on water waste, this discharged water is piped into the bathroom system. Both cleaning and gardening is done with it.

The college has two rainfall collection systems on site that recharge the groundwater in addition to handling discharged RO waste water. In addition to these measures, dry mopping is preferred for floor cleaning. Also tap water leakage is immediately taken care of as and when informed by the maintenance committee. Further maintenance of Central RO is carried out monthly for efficient working.

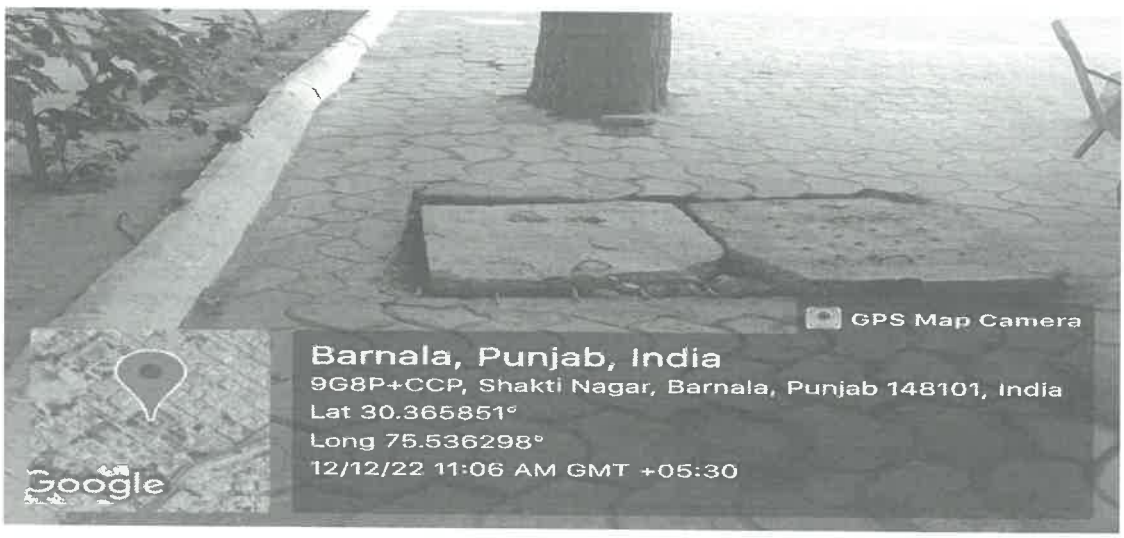
Regarding RO water filtration, the following observations have been taken throughout the entire year.

| S. No. | Month | RO Capacity Per Hour (In Liters) | Usage/Month (In Hours) | Water Filtered (Estimate In Liters) | Water discharged (Estimate In Liters) |
|---|---|---|---|---|---|
| 1. | January | 2000 | 74 | 148000 | 222000 |
| 2. | February | 2000 | 75 | 150000 | 225000 |
| 3. | March | 2000 | 78 | 156000 | 234000 |
| 4. | April | 2000 | 77 | 154000 | 231000 |
| 5. | May | 2000 | 81 | 162000 | 243000 |
| 6. | June | 2000 | 78 | 156000 | 234000 |
| 7. | July | 2000 | 82 | 164000 | 246000 |
| 8. | August | 2000 | 81 | 162000 | 243000 |
| 9. | September | 2000 | 77 | 154000 | 231000 |
| 10. | October | 2000 | 76 | 152000 | 228000 |
| 11. | November | 2000 | 77 | 154000 | 231000 |
| 12. | December | 2000 | 73 | 146000 | 219000 |
| | **Total** | | 929 | 1858000 | 2787000 |



Principal
S.D. College, BARNALA


**Centralised R.O. Plant in College**




**Rain Water Harvesting Pits**

## 2. Solid Waste Management:

On campus, waste is generated in the form of dry tree leaves, canteen and departmental waste, as well as non-biodegradable materials. Waste is separated at the source by installing separate dustbins for biodegradable and non-biodegradable waste. A vermicomposting pit measuring 12 by 8 feet has been constructed to be used for the composting of biodegradable waste produced on the college campus. Vermicompost weighing 270 kg was created throughout the session. Vermicomposting has proven to be effective measure in the institution in managing solid waste

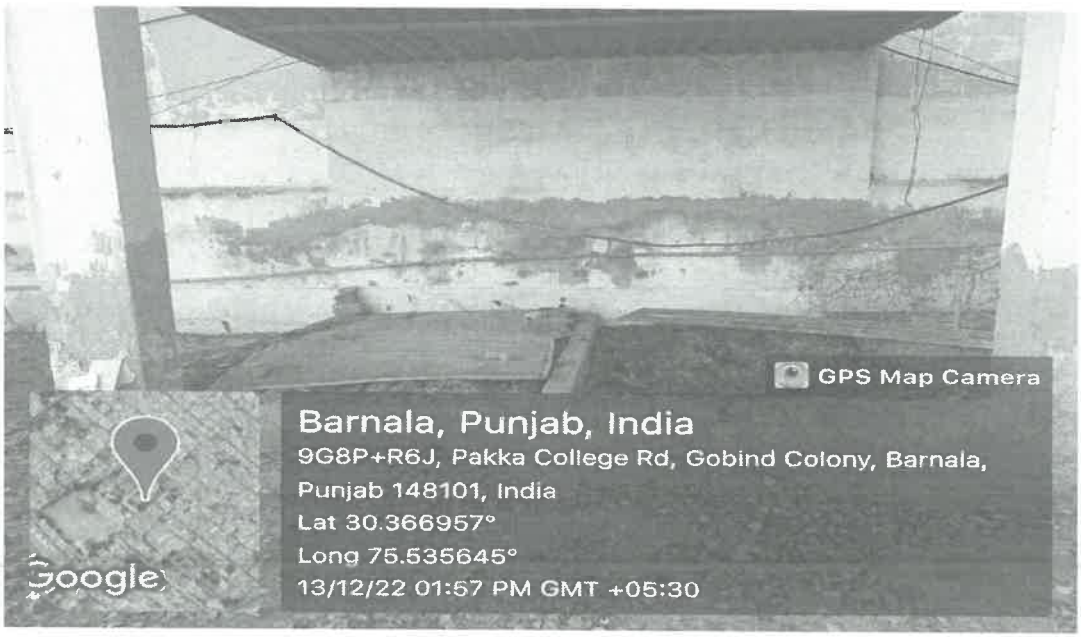


Principal
S.D. College, BARNALA

and has helped in making the most of trash useful. The produced vermicompost is used to nourish the trees and plants on campus. This compost is beneficial for the environment because it reduces the need for chemical fertilizers. One compost pit has been prepared in line with the recommendations made by the Green Initiatives Committee during last year. Paper waste has also been decreased by utilizing the back of previously used paper for writing and printing in all departments. To further reduce the usage of plastic, we have made the decision to use china or ceramic dinnerware at various college events. Eight new color-coded trash cans, one blue and one green, with written information about biodegradable and non-biodegradable garbage have been set up throughout the campus this session. In accordance with the suggestions of Green Initiatives Committee, additional measures have been implemented to end the use of plastic bags on campus.

**Table showing the estimate of vermicompost produced from biodegradable waste in vermicompost unit in the college campus.**

| S.No. | Month | Capacity of Vermicompost Unit (In Kg) | Material Added (Cow dung: Biodegradable Waste) | Vermicompost Produced (In Kg) |
|---|---|---|---|---|
| 1. | Mid-January-March | 100 | 1:1 | 60 |
| 2. | Mid-April – Mid-June | 100 | 1:1 | 69 |
| 3. | July – Mid-September | 100 | 1:1 | 74 |
| 4. | October-December | 100 | 1:1 | 67 |
| | **Total (In Kg)** | | | **270** |






Principal
S.D. College, BARNALA

## Vermicompositing Unit

ਐੱਸ ਡੀ ਕਾਲਜ ਦੇ ਬਾਟਨੀ ਵਿਭਾਗ ਨੇ ਕੈਂਪਸ ਅੰਦਰ ਕਲਰ ਕੋਡਡ ਕੂੜੇਦਾਨ ਲਗਵਾਏ

ਬਰਨਾਲਾ, (ਸ.ਮ. ਬਿਊਰੋ) - ਐੱਸ ਡੀ ਕਾਲਜ ਦੇ ਬਾਟਨੀ ਵਿਭਾਗ (ਡਾ. ਮਨੋਜ ਕੁਮਾਰ ਅਤੇ ਡਾ. ਅਮਰਜੀਪ ਕੌਰ) ਨੇ ਡੀ.ਬੀ.ਟੀ. ਸਟਾਰ ਕਾਲਜ ਸਕੀਮ ਤਹਿਤ ਰੰਗ ਦੇ ਵਰਗੀਕਰਣ ਨਾਲ ਕੰਡ ਕੀਤੇ, ਦੋ ਅਲੱਗ ਰੰਗਾਂ ਵਾਲੇ ਕੂੜੇਦਾਨ ਕਾਲਜ ਕੈਂਪਸ ਅੰਦਰ ਅਲੱਗ-ਅਲੱਗ ਥਾਵਾਂ ਉਪਰ ਲਗਵਾਏ। ਹਰੇ ਰੰਗ ਦੇ ਕੂੜੇਦਾਨ ਉਪਰ 'ਬਾਇਓਡੀਗ੍ਰੇਡੇਬਲ ਵੇਸਟ' ਲਿਖਵਾਇਆ ਗਿਆ ਅਤੇ ਨੀਲੇ ਰੰਗ ਦੇ ਕੂੜੇਦਾਨ ਉਪਰ 'ਨਾਨ-ਬਾਇਓਡੀਗ੍ਰੇਡੇਬਲ ਵੇਸਟ' ਲਿਖਵਾਇਆ ਗਿਆ। ਇਸ ਤਰ੍ਹਾਂ ਹਰੇ ਕੂੜੇਦਾਨ ਵਿਚ ਸਮਘਟਿਤ ਹੋਣ ਵਾਲਾ ਕੂੜਾ ਜਿਵੇਂ ਸਬਿਜਆ ਹੋਇਆ ਖਾਣਾ, ਫਲਾਂ ਦੇ ਛਿਲਕੇ ਆਦਿ ਪਾਏ ਜਾਣ ਅਤੇ ਨੀਲੇ ਕੂੜੇਦਾਨ ਵਿਚ ਕੱਚ, ਪਲਾਸਟਿਕ ਅਤੇ ਧਾਤਾਂ ਆਦਿ ਦਾ ਕੂੜਾ ਪਾਉਣ ਦੀ ਰਵਾਇਤ ਦਿੱਤੀ।(ਅਘਘਟਿਤ ਹੋਣ ਵਾਲਾ ਕੂੜਾ ਕੈਂਪੋਸਟ ਬਣਾਉਣ ਲਈ ਵਰਤੋਂ ਵਿਚ ਲਿਆਂਦਾ ਜਾ ਸਕਦਾ ਹੈ ਅਤੇ ਨਾ-ਸਮਘਟਿਤ ਹੋਣ ਵਾਲੇ ਕੱਚ, ਪਲਾਸਟਿਕ ਆਦਿ ਪਦਾਰਥ ਮੁੜਕ ਚੱਕਰ ਵਜੋਂ ਵੰਨੇ ਦਾ ਸਕਦੇ ਹਨ। ਕਾਲਜ ਕੈਂਪਸ ਵਿਚ ਕੱਚ ਕੱਚ ਥਾਵਾਂ 'ਤੇ ਕੂੜੇਦਾਨ ਰੱਖਣ ਦਾ ਕੰਮ ਬੀ.ਐਸਸੀ ਫਾਰ ਪਹਿਲਾ, ਦੂਜਾ ਅਤੇ ਤੀਜਾ (ਮੈਡੀਕਲ) ਦੇ ਵਿਦਿਆਰਥੀਆਂ ਨੇ ਅਧਿਆਪਕਾਂ ਦੀ ਅਗਵਾਈ ਵਿਚ ਕੀਤਾ। ਇਸ ਤਰ੍ਹਾਂ ਕੱਚ-ਕੱਚ ਰੰਗ ਕੂੜੇਦਾਨ ਵਰਤ ਕੇ ਹੋਵਾਂ ਤਰ੍ਹਾਂ ਦਾ ਕੂੜਾ ਅਲੱਗ ਰੱਖ ਕੇ ਆਸਾਨੀ ਨਾਲ ਟਿਕਾਣੇ ਲਗਾਉਣਾ ਆਸਾਨ ਹੋ ਜਾਵੇਗਾ ਅਤੇ ਕੈਂਪਸ ਨੂੰ ਸਾਫ਼ ਰੱਖਣ ਵਿਚ ਸਹਾਇਤਾ ਮਿਲਦੀ ਹੈ। ਇਸ ਉਪਰਾਲੇ ਉਪਰਾਲੇ ਵਿਚ ਵਾਇਓਲੋਜੀ ਵਿਭਾਗ ਦੇ ਪ੍ਰੋਫੈਸਰ ਸਾਹਿਬਾਨ ਡਾ. ਰੇਨੂ ਮਾਲਾ ਅਤੇ ਡਾ. ਕਮਲਪ੍ਰੀਤ ਕੌਰ ਨੇ ਪੂਰਾ ਸਹਿਯੋਗ ਦਿੱਤਾ। ਕਾਲਜ ਪ੍ਰਬੰਧਕ ਕਮੇਟੀ ਦੇ ਪ੍ਰਧਾਨ ਡਾ. ਅਨੀਸ਼ ਪੁਰਾਚ, ਉਪ ਪ੍ਰਧਾਨ ਸ੍ਰੀ ਨਰੇਸ਼ ਕੁਮਾਰ ਸਿੰਗਲਾ, ਜਨਰਲ ਸਕੱਤਰ ਸ੍ਰੀ ਜਤਿੰਦਰ ਨਾਥ ਸ਼ਰਮਾ, ਫਾਇਨੈਂਸਰ ਸ੍ਰੀ ਹਰਦਿਆਲ ਸਿੰਘ ਅੰਤਰੀ, ਵਿੱਤ ਸਕੱਤਰ ਡਾ. ਮੁਕੰਦ ਲਾਲ ਕੰਸਲ ਅਤੇ ਪ੍ਰਿੰਸੀਪਲ ਡਾ. ਰਮਾ ਸ਼ਰਮਾ ਨੇ ਬਾਟਨੀ ਵਿਭਾਗ ਦੇ ਇਸ ਉਪਰਾਲੇ ਦੀ ਸ਼ਲਾਘਾ ਕੀਤੀ।

ਨਿਪਾਲਕ : * ਸਰਬੀਰ ਸਿੰਘ ਸਰਗੜਾਰ ਛਾਪਕ ਤੇ ਪ੍ਰਕਾਸ਼ਕ : ਜਤਿੰਦਰ ਨਾਥ ਵੋਰਲੋ ਐਸ. ਡੀ. ਕਾਲਜ ਐਜੂਕੇਸ਼ਨਲ ਸੁਸਾਇਟੀ (ਰਜਿ:) ਬਰਨਾਲਾ ਲਈ ਕਾਲਿਕਾ ਪ੍ਰਿੰਟਿੰਗ ਪ੍ਰੈਸ, ਨੇੜੇ ਬੱਸ ਸਟੈਂਡ, ਪਟਿਆਲਾ ਤੋਂ ਛਪਵਾ ਕੇ ਦਫ਼ਤਰ ਐਸ. ਡੀ. ਕਾਲਜ, ਕੱ. ਸੀ. ਰੋਡ, ਨਜ਼ਦੀਕ ਰੇਲਵੇ ਫਾਟਕ, ਬਰਨਾਲਾ ਤੋਂ ਪ੍ਰਕਾਸ਼ਿਤ ਕੀਤਾ। (ਆਰ.ਐਨ.ਆਈ. ਨੰ: PUNPUN/2012/59096) (ਪੋਸਟਲ ਰਜਿ ਨੰ: PB/SRR/043) * ਪੀ.ਆਰ.ਬੀ. ਐਕਟ 1867 ਤਹਿਤ ਖ਼ਬਰਾਂ ਦੀ ਚੋਣ ਲਈ ਜ਼ਿੰਮੇਵਾਰ।

**Colour Coded Dustbins for Segregation of Biodegradable and Non-Biodegradable Wastes**

3. **Energy conservation and Efficiency:** As per the report submitted by Energy & Sustainable Development Committee prepared through physical verification of various sources of energy consumption like electronic and electric devices (blubs, LED, air conditioners, computers, scientific equipments etc.), college consumes 86149 KWH/KVAH units of energy



Principal
S.D. College, BARNALA

amounting to Rs. 799890 during the year. The Committee recommends the efficient use of energy by Use of LED Bulbs, Use of department-wise main On/off switch, Use of HRC switch and MCV switches, Installations of more Solar Plant, Use of energy efficient devices with high stars, Use of solar cell Street light, Use of Motion Sensors in toilets, Replacement of Heater with LPG cylinder in labs, Use of waste water of R.O in toilets so that electricity can be saved for filling the water tanks, Fall ceiling in A.C rooms & Use of Computers in power saving mode etc. for enhancing environmental sustainability and for reducing power consumption. College has solar panel system on the rooftop which reduces the consumption of electricity. The entire amount of power generated by the solar power plant is 77.1 units each day, or 28139 units in a year, which is 32.66 % of the total amount of power used by the college (86149 units).

**Total Power Requirement for Various Equipments (from 10th April to 10th May 2022)**

| S.No. | Items | Electric power (Watt) | Quantity | Daily uses (In hours) | Per Month (Watt) | Unit | Cost in a month |
|---|---|---|---|---|---|---|---|
| 1 | Fan | 75 | 449 | 3 | 2525625 | 2525.63 | 13562.606 |
| 2 | LED Tube | 25 | 253 | 2.5 | 395312.5 | 395.313 | 2122.8281 |
| 3 | LED Bulb | 12 | 66 | 2.5 | 49500 | 49.5 | 265.815 |
| 4 | CFL | 30 | 33 | 2 | 49500 | 49.5 | 265.815 |
| 5 | AC(1.5T) | 2000 | 20 | 2.5 | 2500000 | 2500 | 13425 |
| 6 | Duct AC | 12900 | 1 | 2.5 | 806250 | 806.25 | 4329.5625 |
| 7 | Fridge | 300 | 11 | 6 | 495000 | 495 | 2658.15 |
| 8 | Computer | 200 | 124 | 2.5 | 1550000 | 1550 | 8323.5 |
| 9 | Microwave | 1400 | 6 | 1 | 210000 | 210 | 1127.7 |
| 10 | Projector | 250 | 8 | 1 | 50000 | 50 | 268.5 |
| 11 | Geezers | 2000 | 1 | 0 | 0 | 0 | 0 |
| 12 | Tube set | 40 | 145 | 2 | 290000 | 290 | 1557.3 |
| 13 | Water cooler | 1000 | 4 | 5 | 500000 | 500 | 2685 |
| 14 | Motor(Pump) | 100 | 1 | 1 | 2500 | 2.5 | 13.425 |
| 15 | Patiz Machine | 200 | 1 | 3 | 15000 | 15 | 80.55 |
| 16 | Inverter | 1500 | 4 | 3 | 450000 | 450 | 2416.5 |
| 17 | TV | 50 | 3 | 2 | 7500 | 7.5 | 40.275 |
| 18 | Modem | 12 | 15 | 24 | 108000 | 108 | 579.96 |
| 19 | Photostat machine | 900 | 2 | 1 | 45000 | 45 | 241.65 |
| 20 | UPS | 150 | 12 | 0.5 | 22500 | 22.5 | 120.825 |
| 21 | UPS (B.Voc MLMDT) | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |



Principal
S.D. College, BARNALA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 22 | UPS (B.Voc soft Devt.) | 1000 | 1 | 0.5 | 12500 | 12.5 | 67.125 |
| 23 | UPS(Computer Lab1) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| 24 | UPS(Computer Lab2) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| 25 | UPS (Library) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| 26 | UPS (Admin Block) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| 27 | Exhaust Fan (Large) | 250 | 2 | 3 | 37500 | 37.5 | 201.375 |
| 28 | Exhaust Fan(Small) | 50 | 32 | 4 | 160000 | 160 | 859.2 |
| 29 | Oil heater | 3000 | 1 | 0 | 0 | 0 | 0 |
| 30 | Blower | 2000 | 1 | 0 | 0 | 0 | 0 |
| 31 | Electric kettle | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| 32 | Camera | 50 | 25 | 24 | 750000 | 750 | 4027.5 |
| 33 | RO Plant | 8000 | 1 | 6 | 1200000 | 1200 | 6444 |
| 34 | Flood Light | 50 | 12 | 10 | 150000 | 150 | 805.5 |
| 35 | Currency Machine | 80 | 1 | 2 | 4000 | 4 | 21.48 |
| 36 | Barcode Printer | 70 | 1 | 0.2 | 350 | 0.35 | 1.8795 |
| 37 | Internet Server | 50 | 4 | 24 | 120000 | 120 | 644.4 |
| 38 | S.D College Nameplate | 400 | 1 | 8 | 80000 | 80 | 429.6 |
| 39 | Farata Fan | 250 | 1 | 2 | 12500 | 12.5 | 67.125 |
| 40 | Laptop | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| 41 | Blower Cleaning | 700 | 1 | 0.1 | 1750 | 1.75 | 9.3975 |
| 42 | Vacuum Cleaner | 1400 | 1 | 0.1 | 3500 | 3.5 | 18.795 |
| 43 | Printer | 400 | 24 | 1 | 240000 | 240 | 1288.8 |
| 44 | Washing Machine | 2000 | 1 | 0.2 | 10000 | 10 | 53.7 |
| 45 | Cooler | 250 | 4 | 8 | 200000 | 200 | 1074 |
| 46 | Smart Board | 150 | 1 | 2 | 7500 | 7.5 | 40.275 |
| 47 | Audio Deck | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| 48 | Vendego Machine | 50 | 1 | 0.1 | 125 | 0.125 | 0.67125 |
| | Total (Rs) | | | | | 13346.4 | 71670.235 |



Principal
S.D. College, BARNALA

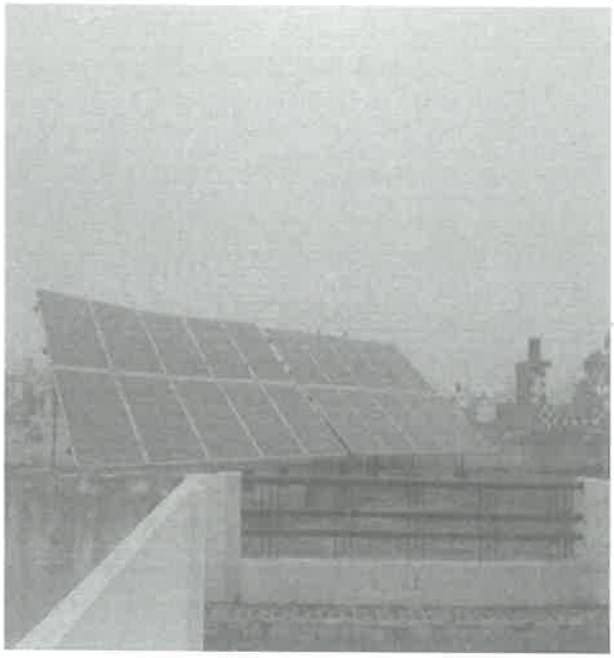
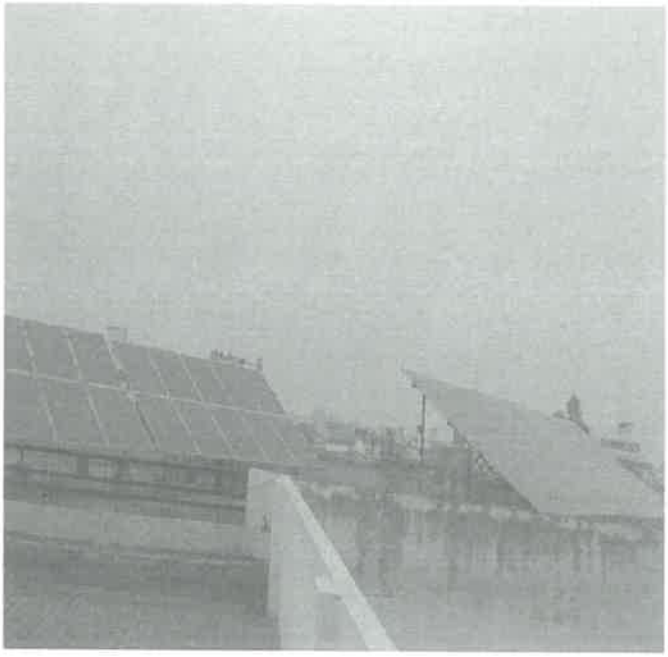
| Power Consumptions from Electricity Board (PSPCL)(Account Numbers 3002944859 ) | | | |
|---|---|---|---|
| S. No. | Month | Consumption Unit (KWH/KVAH) | Total amount (Rs) |
| 1 | 10 April to 10 May 2022 | 8446 | 72880 |
| 2 | 10 May to 10 june 2022 | 12279 | 106930 |
| 3 | 10 June to 10 july 2022 | 11288 | 100780 |
| 4 | 10 July to 10 August 2022 | 11956 | 103790 |
| 5 | 10 August to 10 September 2022 | 11933 | 103600 |
| 6 | 10 September to 10 octuber 2022 | 10942 | 96100 |
| 7 | 10 Octuber to 10 November 2022 | 4724 | 47830 |
| 8 | 10 November to 10 December 2022 | 3321 | 36620 |
| 9 | 10 December to 10 January 2023 | 2696 | 32160 |
| 10 | 10 January to 10 Feb 2023 | 2635 | 31730 |
| 11 | 10 Feb to 10 March 2023 | 2777 | 31740 |
| 12 | 10 March to 10 April 2023 | 3152 | 35730 |
| | Total | 86149 | 799890 |

| Power generated through Solar PLANT<br>Account Numbers 3002944861 | | | |
|---|---|---|---|
| S.No. | Month | Solar System Units | Amount |
| 1. | 28 May to 28 June 2022 | 2561 | 25990 |
| 2 | 28 June to 29 July 2022 | 2363 | 22390 |
| 3 | 29 July to 29 August 2022 | 2591 | 10630 |
| 4 | 29 August to 30 September 2022 | 2623 | 33910 |
| 5 | 30 September to 28 October 2022 | 2491 | 10400 |
| 6 | 28 October to 29 November 2022 | 1910 | 5440 |
| 7 | 29 November to 30 December 2022 | 1595 | 8310 |
| 8 | 30 December to 27 January 2023 | 1378 | 7730 |
| 9 | 27 January to 27 February 2023 | 2273 | 5310 |
| 10 | 27 February to 29 March 2023 | 2574 | 5130 |
| 11 | 29 March 2023 to 28 April 2023 | 2936 | 5130 |
| 12 | 28 April 2023 to 29 May 2023 | 2844 | 6000 |
| | Total | 28139 | 146370 |

**Total consumption of one accounts for 12 Months= 86149 (KWH/KVAH)**
**Total consumption of one accounts for One Month=7179.1 (KWH/KVAH)**



Principal
S.D. College, BARNALA

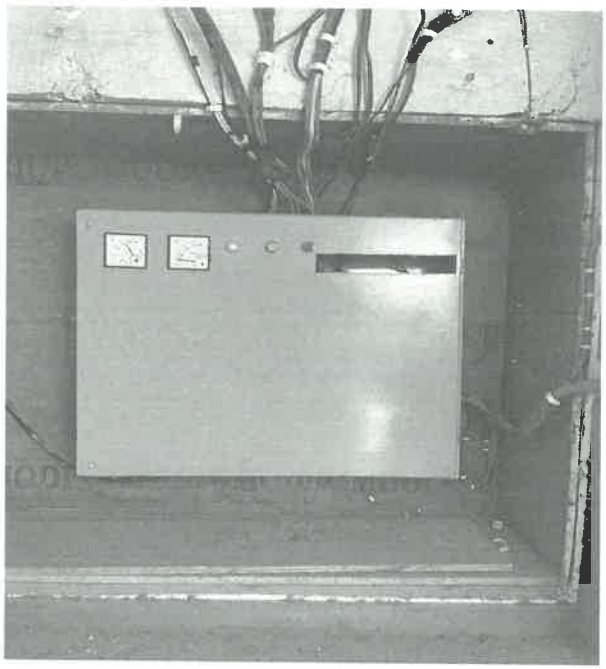
**Solar Power Panels**

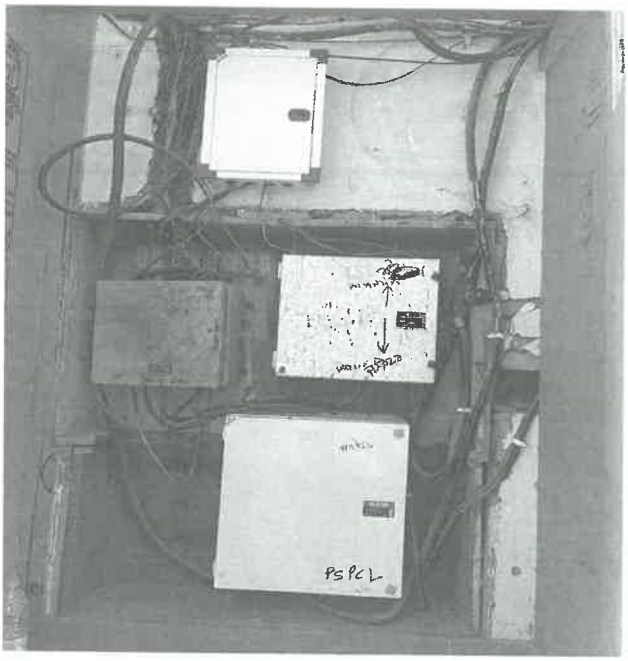

**Curtains fitted in offices**



Principal
S.D. College, BARNALA

**Power supply Earthing for resolving fluctuations in supply**





**HRC Switches fitted in College.**



Principal
S.D. College, BARNALA

4. **e-Waste Management:** According to data gathered by the e-Waste Management Committee, e-waste only comes in the form of CDs, DVDs, and printer cartridges. CDs and DVDs are almost completely outdated due to the rise in email and pendrive usage. Cartridges are used up until the point where they stop working. Dealers buy used computers and update them before reselling them on the market.

5. **Environment Sustainability Enhancement:** According to the Green Audit report, the college has made great efforts to create a productive environment on campus. College campus contains a herbal/medicinal garden as well as an NSS park, all of which have a range of useful and therapeutic plants. *Elletaria cardimomum, Rauwolfia serpentina, Equisetum, Plumbago zeylanicum, Carrisa carandas, Vitex negundo, Phyllanthus* sp., *Boerhaavia diffusa, Ocimum* sp., *Vinca rosea*, etc. are a few examples of medicinal plants that have been successfully produced. The college campus has more than 400 trees, both big and small (see the table below for a count). Dr. Manish Kumar and his group published a research chapter on tree survey (a copy is attached). Approximately 60 trees were planted in the 2022–2023 session. We have planted about 350 ornamental flowers for the winter season (December 5, 2022), including *Salvia, Dimorpha*, Kale, P*etunia* and Calendula. According to the action plan from the previous session, the NSS department has created a vertical garden on campus. On February 10th, 2023, NSS Volunteers from SD College started a project to reuse plastic bottles. They used recycled plastic bottles to create a hanging vertical garden. The event's goal was to raise awareness to protect their environment by using recycled plastic for a variety of uses. For the purpose of minimizing air pollution, we also observe one day each month as a no-vehicle day for college employees and students. NSS wing planted 85 saplings of various native varieties. Preference was given to the shady trees.

**Table 1. List of Trees in the campus of S.D. College, Barnala (Punjab)**

| **Botanical Name** | **Common Name** | **Family** | **No. of Individuals** |
|---|---|---|---|
| *Dalbergia sisso* Roxb. | Sisham | Fabaceae | 05 |
| *Ficus religiosa*L. | Peepal | Moraceae | 05 |
| *Putranjiva roxburghii* Wall. | Putijia | Putranjivaceae | 02 |
| *Pterospermum acerifolium* Willd. | Kanak Champa | Sterculiaceae | 03 |



Principal
S.D. College, BARNALA

| | | | |
|---|---|---|---|
| *Azadirachta indica* L. | Neem | Meliaceae | 10 |
| *Melia azedarach*Linn. | Dek | Meliaceae | 30 |
| *Albizia lebbek*Benth. | Siri | Fabaceae | 03 |
| *Cassia fistula* Linn. | Amaltas | Fabaceae | 09 |
| *Mangifera indica*L. | Amb | Anacardiaceae | 04 |
| *Moringa oleifera*Lam. | Soanjana | Moringaceae | 04 |
| *Delonix regia* (Bojer ex Hook.) Raf. | Gulmohar | Fabaceae | 02 |
| *Aegle marmelos* (L.) Corrêa. | Bael | Rutaceae | 10 |
| *Alstonia scholaris* (L.) R. Br. | Shaitan tree | Apocyanaceae | 05 |
| *Cordia dichotoma*G.Forst | Lasoora | Boraginaceae | 01 |
| *Pongamia glabra*Vent. | Karanj | Fabaceae | 14 |
| *Eucalyptus longifolia* Link & Otto | Safeda | Myrtaceae | 01 |
| *Polyalthia longifolia* Thw. | Ashok | Annonaceae | 195 |
| *Ficus benghalenesis* L. | Bargad | Moraceae | 04 |
| *Ficus racemosa* Linn. | Gular | Moraceae | 07 |
| *Tamarindus indica* L. | Imli | Febaceae | 05 |
| *Tectona grandis* Linn.f. | Sagwan | Verbenaceae | 01 |
| *Syzygium cumini* (L.) Skeels | Jamun | Myrtaceae | 06 |
| *Citrus limon* (Linn.) Burm. f. | Nimbu | Rutaceae | 01 |
| *Terminalia arjuna* (Roxb.) | Arjun | Combretaceae | 17 |
| *Terminalia bellirica* (Gaertn.) Roxb. | Bahera | Combretaceae | 04 |
| *Bauhinia variegata* L. | Kachnar | Fabaceae | 08 |
| *Callistemon lanceolatus* DC. | Cheel | Myrtaceae | 01 |
| *Madhuca longifolia* (J. Konig) J.F.Macbr. | Mahua | Sapotaceae | 01 |
| *Psidium guajava* Linn. | Amrud | Myrtaceae | 06 |
| *Vitex negundo* L. | *Sambhalu* | Lamiaceae | 01 |
| *Prosopis juliflora* (Sw.) DC. | Vilayatikikar | Fabaceae | 01 |
| *Morus alba* Linn. | Sahtoot | Moraceae | 05 |
| *Annona squamosa* L. | Sitaphal | Annonaceae | 01 |
| *Mimusops elengii* L. | Maulsari | Sapotaceae | 05 |



Principal
S.D. College, BARNALA


**Plantation Drives carried out in the campus (5th June. 2023)**

**Students preparing pots from plastic bottles for vertical garden (10th February 2023)**



Principal
S.D. College, BARNALA

| | | | |
|---|---|---|---|
| *Ailanthus altissima* (Mill.) Swingle | Maharukh | Simaroubaceae | 03 |
| *Murraya exotica* Linn., | Kamini | Rutaceae | 02 |
| *Murraya koenigii* (Linn.) Spreng. | Curry Patta | Rutaceae | 03 |
| *Punica granatum*Linn. | Pomegranate | Punicaceae | 02 |
| *Kigelia pinnata* DC. | Balamkheera | Bignoniaceae | 06 |
| *Citrus reticulata* L. | Santra | Rutaceae | 02 |
| *Phyllanthus emblica* L. | Amla | Phyllanthaceae | 08 |
| *Citrus pseudolimon* Tan. | Galgal | Rutaceae | 01 |


**Plantation Drive carried out in the campus (5th Dec. 2022)**



Principal
S.D. College, BARNALA

## CONCLUSION

College has made significant efforts to create a sustainable campus environment. In the past, the college made major efforts to improve the environmental sustainability by installing solar panels, a botanical garden, a vermicomposting unit, a compost pit, and rainwater collection systems in the campus. Through NSS and NCC, the college runs a number of environment awareness Programmes. A few recommendations made by different committees for Green Campus, Sustainable Environment and Energy & Sustainable Development Committees have been achieved.

Principal
S.D. College, BARNALA

# *ENVIRONMENT AUDIT REPORT*

## Session: 2021-22


**Prepared By**

## CAMPUS ENVIRONMENT COMMITTEE
## S.D. College, Barnala
## Punjab (India)

**Audit Date: 29 July 2022**



Principal
S.D. College, BARNALA

# CAMPUS ENVIRONMENT COMMITTEE

## S. D. College, Barnala

| Sr. No. | Name & Designation | Capacity | |
|---|---|---|---|
| 1. | Dr. Reetu Aggarwal<br>Associate Professor in English | Convenor | Reetu Aggarwal |
| 2. | Dr. Manish Kumar<br>Assistant Professor in Botany | Co-convenor | Manish Kumar |
| 3. | Dr. Sanjay Kumar Singh<br>Assistant Professor in Physics | Member | Singh |
| 4. | Mr. Satpal Singh<br>Assistant Professor in English | Member | Satpal Singh |

Principal
S.D. College, BARNALA
Reetu

# CERTIFICATE

This is to certify that an **"Environment Audit"** (Session 2021-22) for S.D. College, Barnala has been conducted in July 2022 to assess the overall environment status of the college and actions to enhance environmental sustainability.

**Place:** Barnala

**Date:** 29 July 2022

Dr. Reetu Aggarwal

**Convenor**

Dr. Manish Kumar

**Co-convenor**

Principal
S.D. College, BARNALA

## Environmental Background

One of the most prominent institutions in the Malwa region of Punjab, S.D. College, Barnala, has made a significant contribution to education and raised students' understanding of a wide range of social concerns. Our college has turned its attention to the environment, which has taken centre stage in the current debate over all concerns. The 6.2 acres that make up the college are home to a sports field, a botanical garden, an NSS park, and a temple open space. The best part of the college is that it is located in residential area that facilitates the students' easy accessibility to it. Due to its proximity to a bus stop and a railway station, students from all around may get there by bus and train. However, its city setting hasn't had an impact on its green belt. On the other side, the green lawns, sports fields and remaining green space have proven to be a blessing in lowering air and noise pollution of the campus and surroundings. The campus also includes a number of academic buildings, rainwater collection systems, solar panels and a vermicomposting facility. The institution is reusing RO discharged water in toilet systems and for landscaping in an effort to decrease water wastage.

Environment audit empowers to:

- Chalk out environment management plans based on the inclusive studies done.
- boost efficacious and economical resource management resulting in curtailing cost and promoting sustainability
- map different programmes to intensify environmental awareness.

Environment Audit Report of SD College Barnala is based on a review of the findings of energy, green and e-waste audits conducted by the College, a desktop review of records, tour of the College campus, and discussion with teaching and non-teaching staff, and students. The Environment Audit Report summarises the overall environment status of the college and actions to enhance environmental sustainability. In addition, it offers suggestions and recommendations for improving environmental sustainability.

**Observations and Recommendations of Campus Environment Committee include:**

1. **Water Efficiency and Rain Water Harvesting**
2. **Solid Waste Management**
3. **Energy conservation and Efficiency**
4. **e-Waste Management**
5. **Environmental Sustainability Enhancement**

Principal
S.D. College, BARNALA

## 1. Water Efficiency and Rain Water Harvesting:

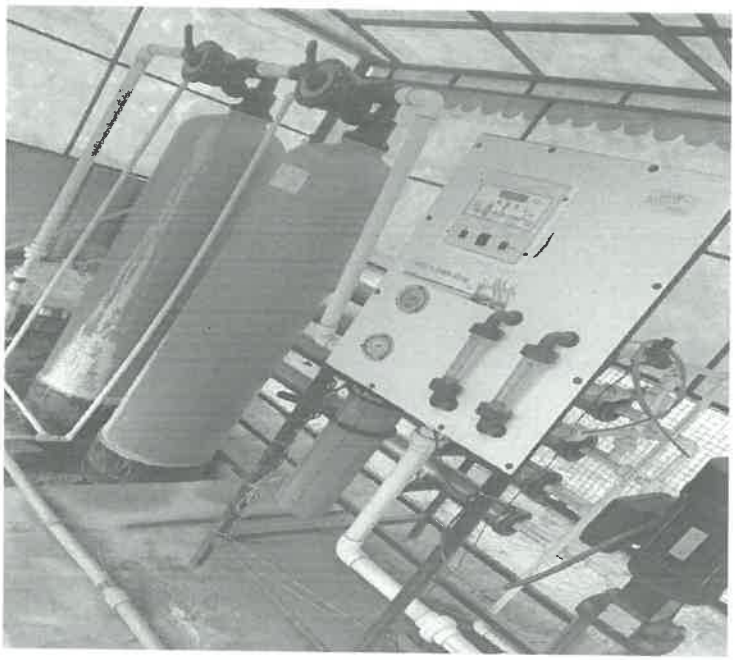
Water for the college is primarily obtained from underground and tap water connected to the Barnala Municipal Committee. The same water is utilised in the RO System for drinking as well as for other tasks like cleaning, gardening, etc. The total volume of water utilised for drinking using a RO system in 2021 is 4588000 litres. According to the Green Audit Report, throughout the filtration process, roughly 27,48,000 litres of water are lost. This discharged water is channelled into the bathroom system for effective water management and to reduce water wastage. It is also used for cleaning and gardening.

Besides managing discharged RO waste water the college has two rainwater harvesting plants in the campus which recharge the groundwater. In addition to these measures, dry mopping is preferred for floor cleaning. Also tap water leakage is immediately taken care of as and when informed by the maintenance committee. Further Mantainence of Central RO is carried out monthly for efficient working.

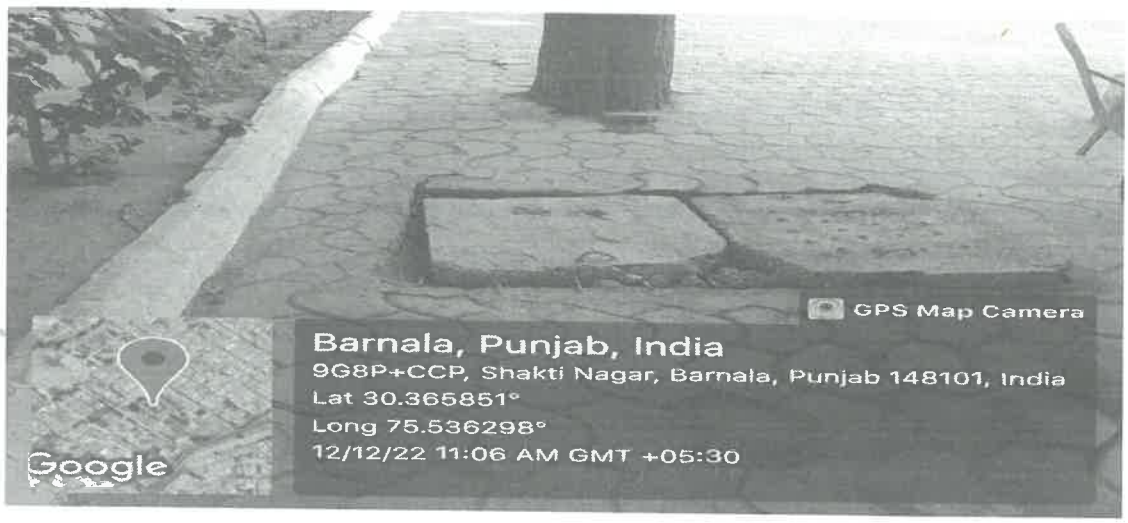
Regarding RO water filtration, the following observations have been taken throughout the year.

| S.No. | Month | RO Capacity Per Hour (In Litres) | Usage/Month (In Hours) | Water Filtered (Estimate In Litres) | Water discharged (Estimate In Litres) |
|---|---|---|---|---|---|
| 1. | January | 2000 | 71 | 152000 | 213000 |
| 2. | February | 2000 | 73 | 148000 | 219000 |
| 3. | March | 2000 | 75 | 154000 | 225000 |
| 4. | April | 2000 | 78 | 152000 | 234000 |
| 5. | May | 2000 | 81 | 160000 | 243000 |
| 6. | June | 2000 | 74 | 142000 | 222000 |
| 7. | July | 2000 | 82 | 162000 | 246000 |
| 8. | August | 2000 | 81 | 160000 | 243000 |
| 9. | September | 2000 | 77 | 152000 | 231000 |
| 10 | October | 2000 | 76 | 154000 | 228000 |
| 11 | November | 2000 | 75 | 156000 | 225000 |
| 12 | December | 2000 | 73 | 148000 | 219000 |
| | **Total** | | **916** | **1840000** | **2748000** |

Principal
S.D. College, BARNALA



**Centralised R.O. Plant in the College**




**Rain Water Harvesting Pits**

**2. Solid Waste Management:** On the college campus, biodegradable and non-biodegradable garbage containers have been installed at various locations to manage solid waste produced in the form of tree leaves and canteen/other waste. Furthermore, the college has built up a vermicomposting unit of 12 x 8 ft. areasize in order to turn this biodegradable waste into organic manure. The prepared manure is used for flowerbeds, botanical gardens, etc. According to the Green Initiatives Committee's evaluation, 275 kg of manure is produced in 2022 using

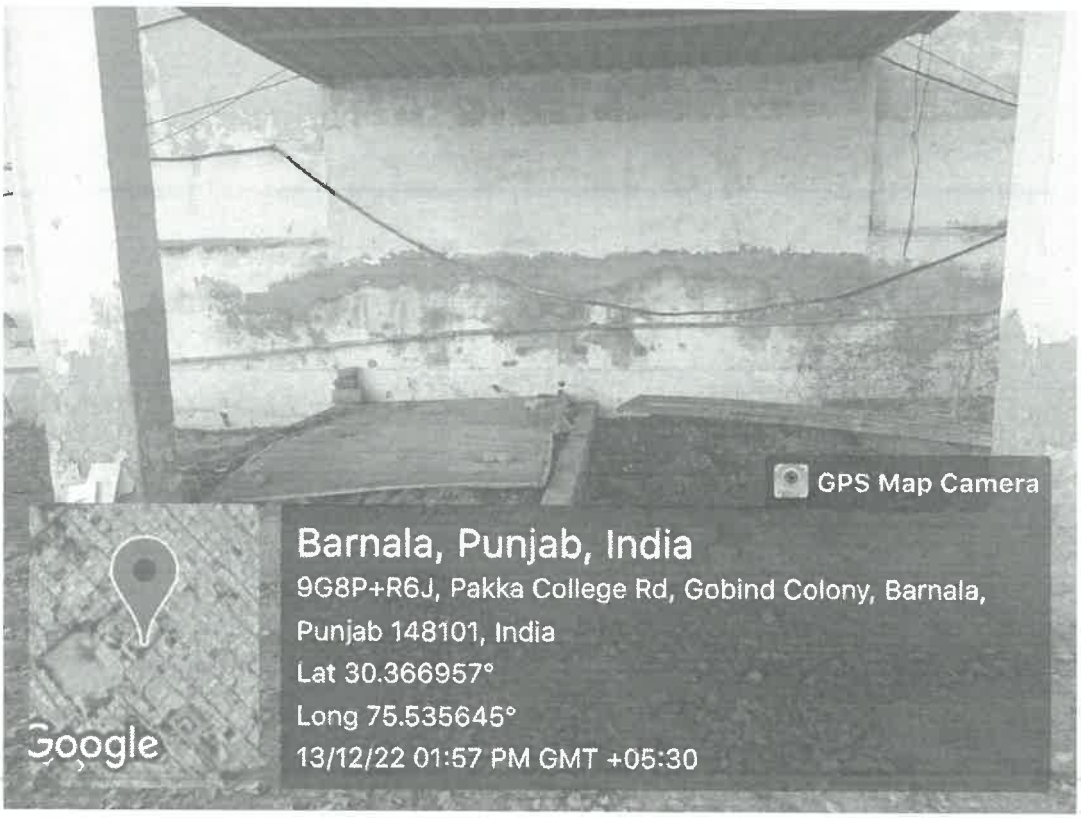


Principal
S.D. College, BARNALA

vermicomposting. One new compost pit has been prepared in line with the recommendations made by the Green Initiatives Committee during the previous session. Additionally, the Campus Environment Committee advises using recycled, eco-friendly, and waste paper for a variety of applications. Further steps have been taken to stop using plastic bags in the campus as per recommendations of Green Initiatives Committee

**Table showing the estimate of vermicompost produced from biodegradable waste in vermicompost unit in the college campus.**

| S.No. | Month | Capacity of Vermicompost Unit (In Kg) | Material Added (Cow dung: Biodegradable Waste) | Vermicompost Produced (In Kg) |
|---|---|---|---|---|
| 1. | Mid-January-March | 100 | 1:1 | 63 |
| 2. | Mid-April – Mid-June | 100 | 1:1 | 72 |
| 3. | July – Mid-September | 100 | 1:1 | 71 |
| 4. | October-December | 100 | 1:1 | 69 |
| | **Total (In Kg)** | | | **275** |




**Vermicompositing Unit**



Principal
S.D. College, BARNALA

3. **Energy conservation and Efficiency:** As per the report submitted by Energy & Sustainable Development Committee prepared through physical verification of various sources of energy consumption like electronic and electric devices (blubs, LED, air conditioners, computers, scientific equipments etc.), college consumes 94791 KWH/KVAH units of energy amounting to Rs. 869274 during the year. The Committee recommends the efficient use of energy by Use of LED Bulbs, Use of department wise main On/off switch, Use of HRC switch and MCV switches, Installations of more Solar Plant, Use of energy efficient devices with high stars, Use of solar cell Street light, Use of Motion Sensors in toilets, Replacement of Heater with LPG cylinder in labs, Use of waste water of R.O in toilets so that electricity can be saved for filling the water tanks, Fall ceiling in A.C rooms & Use of Computers in power saving mode etc. for enhancing environmental sustainability and for reducing power consumption. College has solar panel system on the rooftop which reduces the consumption of electricity. Total number of units of power produced through solar power plant is 48.95 units per day i.e. 17866 units in a year which were 18.85% of the total power consumption (94791 units) of the college. Also during the power cuts, college manages the electricity through two generators of power capacity 15 KW and 20 KW. As per the recommendations of previous year's Energy Audit Report, the curtains got fitted in offices and Labs, HRC switches were installed and earthing was done for saving electricity.

**Total Power Requirement for Various Equipments (from 10th May to 10th June 2021)**

| Sr.No. | Items | Electric power (Watt) | Quantity | Daily uses (In hours) | Per Month (Watt) | Unit | Cost in a month |
|---|---|---|---|---|---|---|---|
| 1 | Fan | 75 | 449 | 3 | 2525625 | 2525.63 | 13562.606 |
| 2 | LED Tube | 25 | 252 | 2.5 | 393750 | 393.75 | 2114.4375 |
| 3 | LED Bulb | 12 | 66 | 2.5 | 49500 | 49.5 | 265.815 |
| 4 | CFL | 30 | 33 | 2 | 49500 | 49.5 | 265.815 |
| 5 | AC(1.5T) | 2000 | 20 | 2.5 | 2500000 | 2500 | 13425 |
| 6 | Duct AC | 12900 | 1 | 2.5 | 806250 | 806.25 | 4329.5625 |
| 7 | Fridge | 300 | 10 | 6 | 450000 | 450 | 2416.5 |
| 8 | Computer | 200 | 124 | 2.5 | 1550000 | 1550 | 8323.5 |
| 9 | Microwave | 1400 | 6 | 1 | 210000 | 210 | 1127.7 |
| 10 | Projector | 250 | 8 | 1 | 50000 | 50 | 268.5 |
| 11 | Geezers | 2000 | 1 | 0 | 0 | 0 | 0 |
| 12 | Tube set | 40 | 145 | 2 | 290000 | 290 | 1557.3 |
| 13 | Water cooler | 1000 | 4 | 5 | 500000 | 500 | 2685 |
| 14 | Motor(Pump) | 100 | 1 | 1 | 2500 | 2.5 | 13.425 |
| 15 | Patiz Machine | 200 | 1 | 3 | 15000 | 15 | 80.55 |



Principal
S.D. College, BARNALA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **16** | **Inverter** | 1500 | 4 | 3 | 450000 | 450 | 2416.5 |
| **17** | **TV** | 50 | 3 | 2 | 7500 | 7.5 | 40.275 |
| **18** | **Modem** | 12 | 15 | 24 | 108000 | 108 | 579.96 |
| **19** | **Photostat machine** | 900 | 2 | 1 | 45000 | 45 | 241.65 |
| **20** | **UPS** | 150 | 3 | 0.5 | 5625 | 5.625 | 30.20625 |
| **21** | **UPS (B.Voc MLMDT)** | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| **22** | **UPS (B.Voc soft Devt.)** | 1000 | 1 | 0.5 | 12500 | 12.5 | 67.125 |
| **23** | **UPS(Computer Lab1)** | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| **24** | **UPS(Computer Lab2)** | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| **25** | **UPS (Library)** | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| **26** | **UPS (Admin Block)** | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| **27** | **Exhaust Fan (Large)** | 250 | 2 | 3 | 37500 | 37.5 | 201.375 |
| **28** | **Exhaust Fan(Small)** | 50 | 32 | 4 | 160000 | 160 | 859.2 |
| **29** | **Oil heater** | 3000 | 1 | 0 | 0 | 0 | 0 |
| **30** | **Blower** | 2000 | 1 | 0 | 0 | 0 | 0 |
| **31** | **Electric kettle** | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| **32** | **Camera** | 50 | 25 | 24 | 750000 | 750 | 4027.5 |
| **33** | **RO Plant** | 8000 | 1 | 6 | 1200000 | 1200 | 6444 |
| **34** | **Flood Light** | 50 | 12 | 10 | 150000 | 150 | 805.5 |
| **35** | **Currency Machine** | 80 | 1 | 2 | 4000 | 4 | 21.48 |
| **36** | **Barcode Printer** | 70 | 1 | 0.2 | 350 | 0.35 | 1.8795 |
| **37** | **Internet Server** | 50 | 4 | 24 | 120000 | 120 | 644.4 |
| **38** | **S.D College Nameplate** | 400 | 1 | 8 | 80000 | 80 | 429.6 |
| **39** | **Farata Fan** | 250 | 1 | 2 | 12500 | 12.5 | 67.125 |
| **40** | **Laptop** | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| **41** | **Blower Cleaning** | 700 | 1 | 0.1 | 1750 | 1.75 | 9.3975 |
| **42** | **Vacuum Cleaner** | 1400 | 1 | 0.1 | 3500 | 3.5 | 18.795 |
| **43** | **Printer** | 400 | 22 | 1 | 220000 | 220 | 1181.4 |
| **44** | **Washing Machine** | 2000 | 1 | 0.2 | 10000 | 10 | 53.7 |
| **45** | **Cooler** | 250 | 3 | 8 | 150000 | 150 | 805.5 |
| **46** | **Smart Board** | 150 | 1 | 2 | 7500 | 7.5 | 40.275 |
| **47** | **Audio Deck** | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| **48** | **Vendego Machine** | 50 | 1 | 0.1 | 125 | 0.125 | 0.67125 |
| | **Total (Rs)** | | | | | | **70953.676** |



Principal
S.D. College, BARNALA

| Power Consumptions from Electricity Board (PSPCL) (Account Numbers 3002944859 & 3002941984 ) | | | |
|---|---|---|---|
| **Sr. No.** | **Month** | **Consumption Unit (KWH/KVAH)** | **Total Amount (Rs)** |
| **1** | **10 May to 10 June 2020** | 4042 | 41450 |
| **2** | **10 June to 10 July 2020** | 7153 | 66870 |
| **3** | **10 July to 10 August 2020** | 10882 | 98300 |
| **4** | **10 August to 10 September 2020** | 12610 | 112520 |
| **5** | **10 September to 10 October 2020** | 9313 | 90490 |
| **6** | **10 October to 10 November 2020** | 5892 | 58110 |
| **7** | **10 November to 10 December 2020** | 3554 | 40090 |
| **8** | **10 December to 10 January 2021** | 3727 | 40780 |
| **9** | **10 January to 10 February 2021** | 3559 | 39780 |
| **10** | **10 February to 10 March 2021** | 3579 | 38350 |
| **11** | **10 March to 10 April 2021** | 4365 | 45430 |
| **12** | **10 April to 10 May 2021** | 8249 | 72880 |
| **Total** | | 76925 | 745050 |

**Total consumption of three accounts for 12 Months=94791 (KWH/KVAH)**
**Total consumption of three accounts for One Month=7899.25(KWH/KVAH)**

| S.No. | Month | Solar System Units | Amount (Rs) |
|---|---|---|---|
| **1** | **31 May to 30 June 2021** | 1976 | 5100 |
| **2** | **30 June to 26 July 2021** | 2261 | 4820 |
| **3** | **26 July to 30 Sept 2021** | 4181 | 24300 |
| **4** | **30 Sept to 29 Nov 2021** | 2032 | 18410 |
| **5** | **29 Nov to 27 Dec 2021** | 1076 | 4744 |
| **6** | **27 Dec to 27 January 2022** | 693 | 5690 |
| **7** | **27 Jan to 26 feb 2022** | 1161 | 8790 |
| **8** | **26 Feb to 28 March** | 1568 | 11970 |
| **9** | **28 March to 27 april 2022** | 930 | 15780 |
| **10** | **27 April to 27 May 2022** | 1988 | 24620 |
| **Total** | | 17866 | 1,24,224 |



Principal
S.D. College, BARNALA

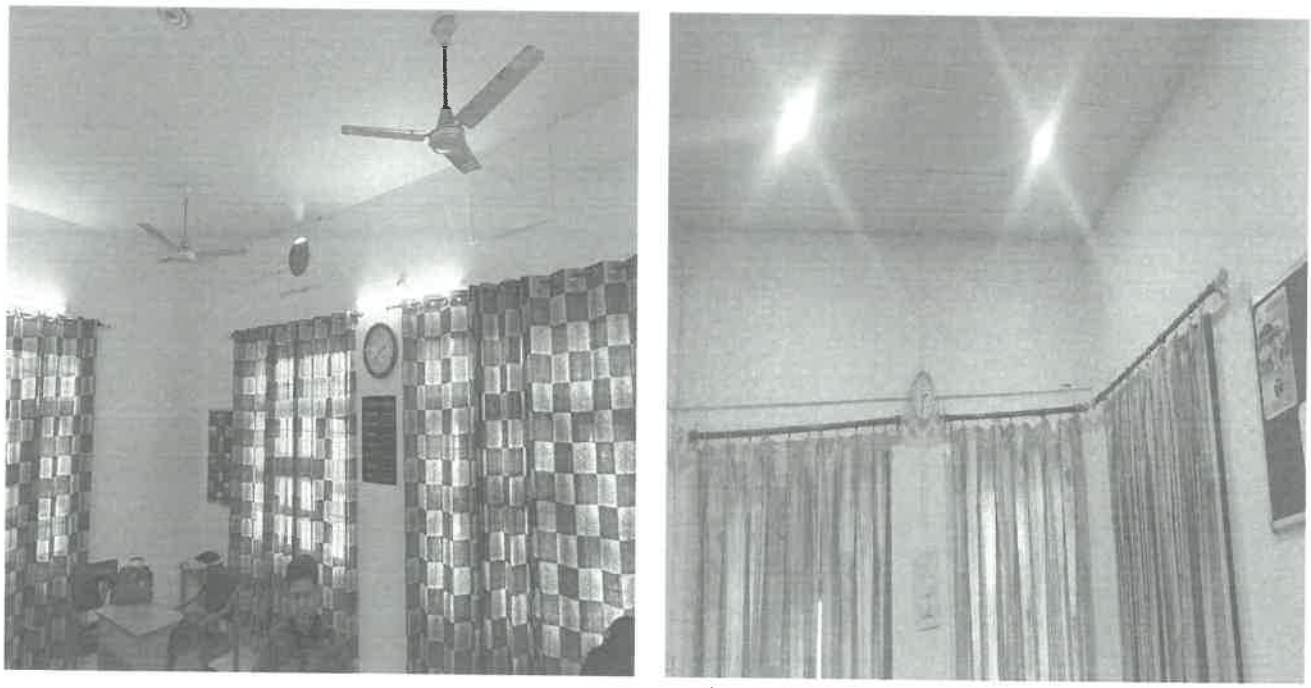
| Power through Solar PLANT<br>Account Numbers 3002944861 | | |
|---|---|---|
| **S. No.** | **Month** | **Solar System Units** |
| **1** | **31 May to 30 June 2021** | 1976 |
| **2** | **30 June to 26 July 2021** | 2261 |
| **3** | **26 July to 30 September 2021** | 4181 |
| **4** | **30 September to 29 November 2021** | 2032 |
| **5** | **29 November to 27 December 2021** | 1076 |
| **6** | **27 December to 27 January 2022** | 693 |
| **7** | **27 January to 26 February 2022** | 1161 |
| **8** | **26 February to 28 March 2022** | 1568 |
| **9** | **28 March to 27 April 2022** | 930 |
| **10** | **27 April to 27 May 2022** | 1988 |
| | **Total** | 17866 |
| | **Average Unit Per day** | 48.95 |

**Use of LEDs in Computer Lab 1**



Principal
S.D. College, BARNALA

**Solar Power Panels**



**Curtains fitted in offices**

4. **e-Waste Management:** According to data gathered by the e-Waste Management Committee, e-waste only comes in the form of CDs, DVDs, and printer cartridges. CDs and DVDs are almost completely outdated due to the rise in email and pendrive usage. Cartridges are

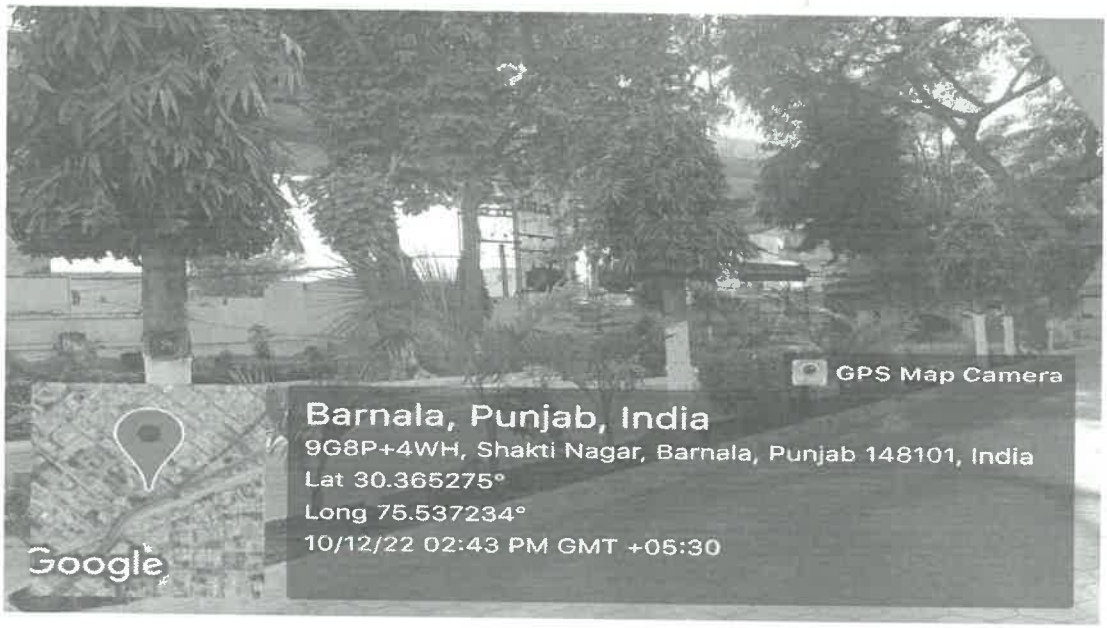


Principal
S.D. College, BARNALA

used up until the point where they stop working. Dealers buy used computers and update them before reselling them on the market. Further, MOU has been signed between SD College Educational Society and Karo Sambhav Private Limited to manage the e-waste in the campus.

5. **Environment Sustainability Enhancement:** As per Green Audit Report, College has done tremendous efforts to develop an efficient environment in the campus, The Institution has created a botanical/herbal garden to create efficient ecosystem in the campus. Different species of herbs/medicinal plants have been grown successfully that include *Calotropis procera, Elletaria cardimomum, Rauwolfia serpentina, Equisetum, Plumbago zeylanicum, Carrisa carandas, Vitex negundo, Phyllanthus* sp., *Boerhaavia diffusa, Ocimum sp. Asparagus*, *Vinca rosea* etc. There are more than 400 trees in the college campus belonging to 42 species. The dominating families of trees are fabaceae and rutaceae. Some of the trees which are growing in the campus include *Dalbergia sisso, Ficus religiosa Putranjiva roxburghii, Pterospermum acerifolium, Azadirachta indica, Melia azedarach, Albizia lebbek, Cassia fistula, Mangifera indicaL, Moringa oleifera, Delonix regia, Aegle marmelos, Alstonia scholaris, Cordia dichotoma, Pongamia glabra, Eucalyptus longifolia, Polyalthia longifolia, Ficus benghalenesis, Tamarindus indica, Tectona grandis,* Syzygium cumini, Citrus limon etc. Medicinal and flowering plants/trees growing in the garden/campus attract numerous insects/birds which play a crucial role in maintaining balance in the ecosystem. This garden not only benefits students in their course of study and research but also benefits local community as it provides required medicinal herbs to the people. More than 100 ornamental plants were planted in December 2021. About 25 trees were planted in the march 2022. Further celebrating World Environment day, students & faculty members donated and planted 125 potted plants and trees in June 2022. As per the action plans of last session, installation of vertical garden is in process. One of the recommendations of the green audit committee in the action plan of last session, NO VEHICLE DAY has been implemented and is observed quarterly.

Principal
S.D. College, BARNALA

1. 


**Botanical Garden in the College**

## CONCLUSION

College has made significant efforts to create a sustainable campus environment. In the past, the college made major efforts to improve the environmental sustainability by installing solar panels, a botanical garden, a vermicomposting unit, a compost pit, and rainwater collection systems in the campus. Through NSS and NCC, the college runs a number of environmental awareness



Principal
S.D. College, BARNALA

programmes. A few recommendations made by different committees for Green and sustainable environment have been achieved.

Principal
S.D. College, BARNALA

# *ENVIRONMENT AUDIT REPORT*

**Session: 2020-21**


**Prepared By**

**CAMPUS ENVIRONMENT COMMITTEE**

**S.D. College, Barnala**

**Punjab (India)**



Principal
S.D. College, BARNALA

# CAMPUS ENVIRONMENT COMMITTEE

## S. D. College, Barnala

| Sr. No. | Name & Designation | Capacity | |
|---|---|---|---|
| 1. | Dr. Reetu Aggarwal<br>Department of English | Convenor | Reetu Aggarwal |
| 2. | Dr. Manish Kumar<br>Department of Biology | Co-convenor | Manish Kumar |
| 3. | Dr. Sanjay Kumar Singh<br>Department of Physics | Member | |
| 4. | Mr. Satpal Singh<br>Department of English | Member | Satpal Singh |

Principal
S.D. College, BARNALA
Reetu

## Environmental Background

S.D. College, Barnala, one of the most prestigious colleges in the Malwa region of Punjab has left its imprints in the field of education and in generating remarkable awareness regarding various issues concerning society among the students. Environment, which has occupied the centre stage of all the issues in the present scenario, has become a point of focus for our college also. The college covers area of 6.2 acres, which includes a sports ground, a botanical garden, an NSS park and a temple open area. The best part of the college is that it is located in residential area that facilitates the students' easy accessibility to it. As it is near railway station & bus stand, so the students from far and wide can come through trains as well as by buses. However, its location in the city has not affected its green belt. On the other hand, the lawns, sports ground and rest of its green area has proved to be a boon in reducing the noise pollution and air pollution in the campus and its surroundings. Besides this, the campus encompasses multiple academic buildings, rainwater harvesting systems, solar panels and vermicompositing unit. To reduce wastage of the RO discharged water, college is reusing this water constructively in lavatory systems and for gardening.

Environment audit empowers to:

- chalk out environment management plans based on the inclusive studies done.
- boost efficacious and economical resource management resulting in curtailing cost and promoting sustainability
- map different programmes to intensify environmental awareness.

Environment Audit Report of SD College Barnala is based on a review of the findings of energy, green and e-waste audits conducted by the College, a desktop review of records, tour of the



Principal
S.D. College, BARNALA

College campus, and discussion with teaching and non-teaching staff, and students. The Environment Audit Report summarises the College's overall environment status and actions to enhance environmental sustainability. In addition, it offers suggestions and recommendations for improving environmental sustainability.

**Observations and Recommendations of Campus Environment Committee include:**

1. **Water Efficiency and Rain Water Harvesting**
2. **Solid Waste Management**
3. **Energy conservation and Efficiency**
4. **e-Waste Management**
5. **Environmental Sustainability Enhancement**

1. **Water Efficiency and Rain Water Harvesting:**

Major source of water for college is tap water connected with Barnala Municipal Committee and underground water drawn with Borewell. The same water is used for RO System for consumption and for other purposes like gardening, cleaning etc. Total amount of water used for RO system for drinking in the year 2020 is 4600000 litres. As mentioned in Green Audit Report, about 2760000 litres of water is discharged during the filtration process. For the efficient water management and to curtail the wastage of water, this discharged water is channelized into lavatory system and also utilized for gardening and cleaning purposes.

Besides managing discharged RO waste water the college has two rainwater harvesting plants in the campus which recharge the groundwater. In addition to these measures, dry

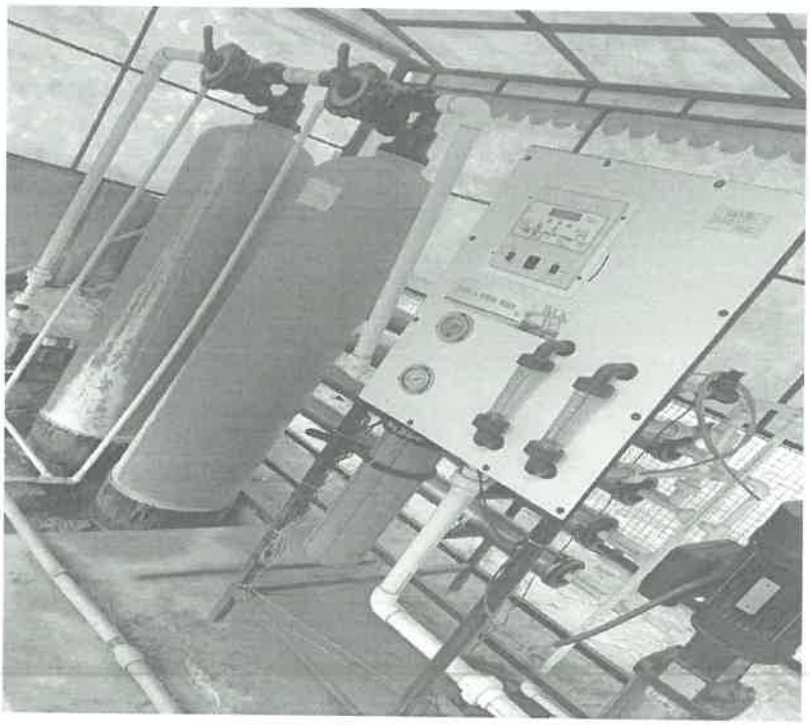


Principal
S.D. College, BARNALA

mopping is preferred for floor cleaning. Also tap water leakage is immediately taken care of as and when informed by the maintenance committee.

**Following observations are made for the year 2020 w.r.t. to RO water filtration.**

| S.No. | Month | RO Capacity Per Hour (In Litres) | Usage/Month (In Hours) | Water Filtered (Estimate In Litres) | Water discharged (Estimate In Litres) |
|---|---|---|---|---|---|
| 1. | January | 2000 | 76 | 152000 | 228000 |
| 2. | February | 2000 | 74 | 148000 | 222000 |
| 3. | March | 2000 | 77 | 154000 | 231000 |
| 4. | April | 2000 | 76 | 152000 | 228000 |
| 5. | May | 2000 | 80 | 160000 | 240000 |
| 6. | June | 2000 | 71 | 142000 | 213000 |
| 7. | July | 2000 | 81 | 162000 | 243000 |
| 8. | August | 2000 | 80 | 160000 | 240000 |
| 9. | September | 2000 | 76 | 152000 | 228000 |
| 10 | October | 2000 | 77 | 154000 | 231000 |
| 11 | November | 2000 | 78 | 156000 | 234000 |
| 12 | December | 2000 | 74 | 148000 | 222000 |
| | **Total** | | **931** | **1840000** | **2760000** |



**Centralised R.O. Plant in the College**



Principal
S.D. College, BARNALA

**Rain Water Harvesting Pits**

2. **Solid Waste Management:** To manage solid waste generated in the form of tree leaves and canteen waste separate bins are installed for biodegradable and non-biodegradable waste at different places in the college campus. Further, in order to convert this biodegradable waste into organic manure, college has setup a vermicomposting unit of 12x8 ft. area. Manure thus ready is used in flower beds, botanical garden etc. As reviewed by Green Initiatives Committee 274 kg manure is produced in the year 2020. In addition to this Campus Environment Committee recommends use of eco-friendly and recycled material & scrap papers for different purposes. Total prohibition of plastic bags, glasses, spoons & other materials is also recommended. Green Initiatives Committee also mentioned establishment of compositing pits in the next session for managing biodegradable solid waste.



Principal
S.D. College, BARNALA

| **Estimate of vermicompost produced from biodegradable waste in vermicompost unit in the college campus.** | | | | |
|---|---|---|---|---|
| **S.No.** | **Month** | **Capacity of Vermicompost Unit (In Kg)** | **Material Added (Cow dung: Biodegradable Waste)** | **Vermicompost Produced (In Kg)** |
| 1. | Mid-January-March | 100 | 1:1 | 65 |
| 2. | Mid-April – Mid-June | 100 | 1:1 | 70 |
| 3. | July – Mid-September | 100 | 1:1 | 71 |
| 4. | October-December | 100 | 1:1 | 68 |
| | **Total (In Kg)** | | | **274** |


**Vermicompositing Unit**

3. **Energy conservation and Efficiency:** As per the report submitted by Energy & Sustainable Development Committee prepared through physical verification of various sources of energy consumption like electronic and electric devices (blubs, LED, air



Principal
S.D. College, BARNALA

conditioners, computers, scientific equipments etc.), college consumes 95413 KWH/KVAH units of energy amounting to Rs. 838991 during the year. The Committee recommends the efficient use of energy by use of LED Bulbs, use of solar reflectors, use of curtains in AC rooms, installation of more solar cell streetlights etc. for enhancing environmental sustainability and for reducing power consumption. College has solar panel system on the rooftop which reduces the consumption of electricity. Total number of units of power produced through solar power plant is 57.91 units per day i.e. 21137.15 units in a year which was 22.15% of the total power consumption (95413 units) of the college.

**Total Power Requirement for Various Equipments (from 10th May to 10th June 2020)**

| S.No. | Items | Electric power (Watt) | Quantity | Average Daily uses (In hours) | Per Month (Watt) | Unit | Cost in a month |
|---|---|---|---|---|---|---|---|
| 1 | Fan | 75 | 435 | 3 | 2446875 | 2446.88 | 13139.719 |
| 2 | LED Tube | 25 | 250 | 3 | 468750 | 468.75 | 2517.1875 |
| 3 | LED Bulb | 12 | 64 | 3 | 57600 | 57.6 | 309.312 |
| 4 | CFL | 30 | 33 | 3 | 74250 | 74.25 | 398.7225 |
| 5 | AC(1.5T) | 2000 | 19 | 3 | 2850000 | 2850 | 15304.5 |
| 6 | Duct AC | 12900 | 1 | 4 | 1290000 | 1290 | 6927.3 |
| 7 | Fridge | 300 | 9 | 6 | 405000 | 405 | 2174.85 |
| 8 | Computer | 200 | 122 | 3 | 1830000 | 1830 | 9827.1 |
| 9 | Microwave | 1400 | 6 | 1 | 210000 | 210 | 1127.7 |
| 10 | Projector | 250 | 5 | 1 | 31250 | 31.25 | 167.8125 |
| 11 | Geezers | 2000 | 1 | 0 | 0 | 0 | 0 |
| 12 | Tube set | 40 | 145 | 3 | 435000 | 435 | 2335.95 |
| 13 | Water cooler | 1000 | 2 | 6 | 300000 | 300 | 1611 |
| 14 | Motor(Pump) | 100 | 1 | 1 | 2500 | 2.5 | 13.425 |
| 15 | Patiz Machine | 200 | 2 | 4 | 40000 | 40 | 214.8 |
| 16 | Inverter | 1500 | 4 | 6 | 900000 | 900 | 4833 |
| 17 | TV | 50 | 3 | 6 | 22500 | 22.5 | 120.825 |
| 18 | Modem | 12 | 14 | 24 | 100800 | 100.8 | 541.296 |



Principal
S.D. College, BARNALA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **19** | Photostat machine | 900 | 2 | 1 | 45000 | 45 | 241.65 |
| **20** | UPS | 150 | 3 | 0.5 | 5625 | 5.625 | 30.20625 |
| **21** | UPS (B.Voc MLMDT) | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| **22** | UPS (B.Voc soft Devt.) | 1000 | 1 | 0.5 | 12500 | 12.5 | 67.125 |
| **23** | UPS(Computer Lab1) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| **24** | UPS(Computer Lab2) | 6000 | 1 | 0.5 | 75000 | 75 | 402.75 |
| **25** | UPS (Library) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| **26** | UPS (Admin Block) | 3000 | 1 | 0.5 | 37500 | 37.5 | 201.375 |
| **27** | Exhaust Fan (Large) | 250 | 2 | 3 | 37500 | 37.5 | 201.375 |
| **28** | Exhaust Fan(Small) | 50 | 32 | 4 | 160000 | 160 | 859.2 |
| **29** | Oil heater | 3000 | 1 | 0 | 0 | 0 | 0 |
| **30** | Blower | 2000 | 1 | 0 | 0 | 0 | 0 |
| **31** | Electric kettle | 1000 | 2 | 0.5 | 25000 | 25 | 134.25 |
| **32** | Camera | 50 | 25 | 24 | 750000 | 750 | 4027.5 |
| **33** | RO Plant | 8000 | 1 | 6 | 1200000 | 1200 | 6444 |
| **34** | Flood Light | 50 | 12 | 10 | 150000 | 150 | 805.5 |
| **35** | Currency Machine | 80 | 1 | 2 | 4000 | 4 | 21.48 |
| **36** | Barcode Printer | 70 | 1 | 0.2 | 350 | 0.35 | 1.8795 |
| **37** | Internet Server | 50 | 4 | 24 | 120000 | 120 | 644.4 |
| **38** | S.D College Nameplate | 400 | 1 | 8 | 80000 | 80 | 429.6 |
| **39** | Farata Fan | 250 | 1 | 4 | 25000 | 25 | 134.25 |
| **40** | Laptop | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| **41** | Blower Cleaning | 700 | 1 | 0.1 | 1750 | 1.75 | 9.3975 |
| **42** | Vacuum Cleaner | 1400 | 1 | 0.1 | 3500 | 3.5 | 18.795 |
| **43** | Printer | 400 | 20 | 1 | 200000 | 200 | 1074 |
| **44** | Washing Machine | 2000 | 1 | 0.2 | 10000 | 10 | 53.7 |
| **45** | Cooler | 250 | 3 | 8 | 150000 | 150 | 805.5 |
| **46** | Smart Board | 150 | 1 | 2 | 7500 | 7.5 | 40.275 |
| **47** | Audio Deck | 100 | 1 | 2 | 5000 | 5 | 26.85 |
| **48** | Vendego Machine | 50 | 1 | 0.1 | 125 | 0.125 | 0.67125 |



Principal
S.D. College, BARNALA

| | | |
|---|---|---|
| | **Total (Rs)** | **79005.454** |

| **Power Consumption from Electricity Board (PSPCL) (Account Numbers 3002944859 & 3002941984 )** | | | |
|---|---|---|---|
| **Sr. No.** | **Month** | **Consumption Unit (KWH/KVAH)** | **Total Amount (Rs)** |
| **1** | 10 May to 10 June 2020 | 4426 | 126910 |
| **2** | 10 June to 10 July 2020 | 6654 | 65690 |
| **3** | 10 July to 10 August 2020 | 8797 | 78880 |
| **4** | 10 August to 10 September 2020 | 9410 | 83810 |
| **5** | 10 September to 10 October 2020 | 11181 | 96490 |
| **6** | 10 October to 10 November 2020 | 6239 | 58449 |
| **7** | 10 November to 10 December 2020 | 4653 | 45380 |
| **8** | 10 December to 10 January 2021 | 4661 | 45460 |
| **9** | 10 January to 10 February 2021 | 4604 | 43750 |
| **10** | 10 February to 10 March 2021 | 4764 | 44140 |
| **11** | 10 March to 10 April 2021 | 4221 | 38540 |
| **12** | 10 April to 10 May 2021 | 4557 | 43490 |
| **Total** | | **74167(KWH/KVAH)** | **770948(Rs)** |

| **Power Consumption of Electricity Board (PSPCL) (Account Numbers 3002944861 )** | | | |
|---|---|---|---|
| **Sr. no.** | **Month** | **Total Consumption Unit (KWH/KVAH)** | **Total Amount (Rs)** |
| **1** | 31 May to 6 August 2020 | 3039 | 11350 |
| **2** | 6 August to 30 September 2020 | 5396 | 9310 |
| **3** | 30 September to 18 November 2020 | 3060 | 13640 |
| **4** | 18 November 2020 to 30 January 2021 | 3620 | 12840 |
| **5** | 30 January to 28 February 2021 | 1319 | 4903 |
| **6** | 28 February to 31 March 2021 | 1564 | 5300 |
| **7** | 1 April to 30 April 2021 | 1505 | 5262 |
| **8** | 30 April to 31 May 2021 | 1743 | 5438 |
| | **Total** | **21246(KWH/KVAH)** | **68043(Rs.)** |

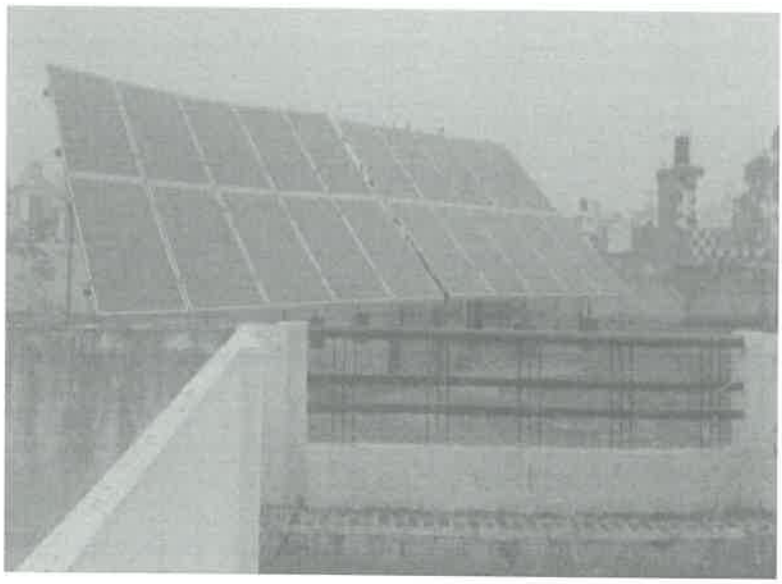
**Total consumption of three accounts for 12 Months=95413 (KWH/KVAH)**

**Total consumption of three accounts for One Month=7951.08(KWH/KVAH)**



Principal
S.D. College, BARNALA

| Power through Solar Plant | | |
|---|---|---|
| **Sr. no.** | **Month** | **Solar System Units** |
| **1** | **31 May to 6 August 2020** | **3533** |
| **2** | **6 August to 30 September 2020** | **4002** |
| **3** | **30 September to 18 November 2020** | **2390** |
| **4** | **18 November 2020 to 30 January 2021** | **3558** |
| **5** | **30 January to 28 February 2021** | **1997** |
| **6** | **28 February to 31 March 2021** | **1700** |
| **7** | **1 April to 30 April 2021** | **1900** |
| **8** | **30 April to 31 May 2021** | **2057** |
| | **Total** | **21137** |
| | **Average Unit per day** | **57.91** |



**Solar Power Plant in the College**

4. **e-Waste Management:** According to information collected from the e-Waste Management Committee, e-waste only exists in the form of CDs, DVDs, and printer cartridges, and that too in modest quantity. With the increased usage of email and pendrives, CDs and DVDs have become nearly obsolete. Cartridges are utilised until they are no longer functional. Old computer systems are sold to dealers who update them before reselling them in the market.



Principal
S.D. College, BARNALA

5. **Environment Sustainability Enhancement:** As per Green Audit Report, College has done tremendous efforts to develop an efficient environment in the campus, the institution has created a botanical/herbal garden. In a designated area, students, instructors, and support personnel have planted some herbal/medicinal plants. In the college campus, there are 391 trees. In the session 2020-21, 30 additional trees were planted. We have 80 different species of plants belonging to varied families. Green initiatives committee has recommended creation of a Vertical Garden by reusing plastic bottles and containers, which will reduce plastic waste and serve as an addition to the college's green space. Unused area in college campus will increasingly be used for planting. Further Committee has also recommended that in every month, a no-vehicle day should be observed for college faculty and students to reduce air pollution. Besides this, instead of spilling used chemicals in sinks, labs will utilise separate containers to dispose of them.

| **Number of plants species growing in the botanical garden and college campus.** | | | |
|---|---|---|---|
| **S.No.** | **Plants** | **Number** | |
| **1.** | Angiosperms | 75 | Dicots: 67 |
| | | | Monocots: 08 |
| **2.** | Gymnosperms | 04 | |
| **3.** | Pteridophytes | 01 | |

Principal
S.D. College, BARNALA

**Botanical Garden in the College**

## CONCLUSION

College has taken substantial steps and done efforts to make campus environment sustainable. In this regard, College has installed solar panels, botanical garden, vermicomposting unit and rainwater harvesting systems in past which is a significant effort towards environment sustainability and making the campus more environment friendly. College has organized various Environmental awareness campaigns through NSS and NCC. A few suggestions are made earlier by various committees to pave the way for a bright future in the framework of Green and sustainable environment which college has consented to work upon.

Principal
S.D. College, BARNALA

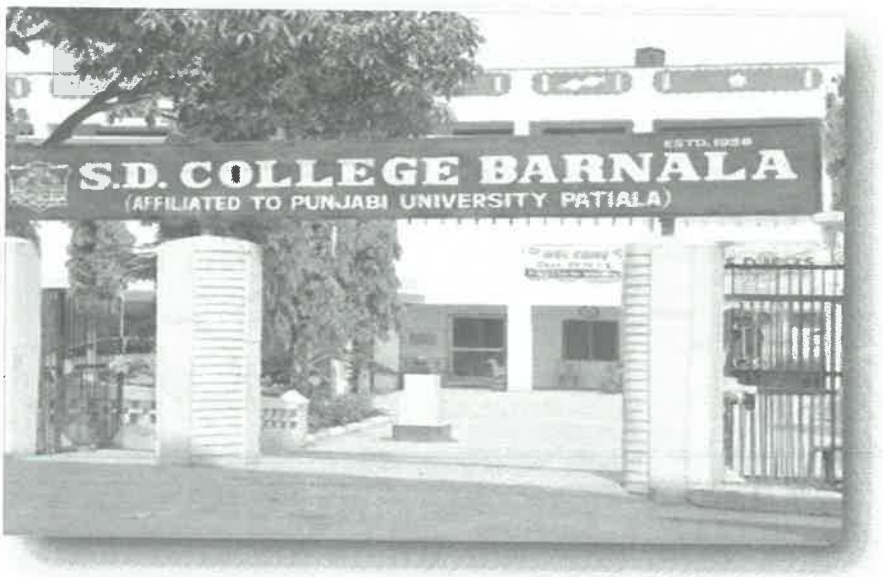
Rama Sharma
Digitally signed by Rama Sharma
Date: 2023.11.04 14:10:35 +05'30'



Principal S D
College Barnala

# *GREEN AUDIT REPORT*

# Session: 2022-23




## PREPARED BY:

## GREEN INITIATIVES COMMITTEE

**S.D. College, Barnala, Punjab (India)**

**(Established in 1956)**
**(Affiliated to Punjabi University, Patiala)**
**(Under UGC Act 2f & 12b)**
**(NAAC Accredited)**
**(Grant in aid from Punjab Govt.)**
**Website : http://sdcollegeinstitutions.org**

## Audit Date: 27 July 2023



Principal
S.D. College, BARNALA

**Green Initiatives Committee**

**S.D. College, Barnala**

| Sr. No. | Name & Designation | Capacity | |
|---|---|---|---|
| 1. | Dr. Reetu Aggarwal<br>Department of English | Convener | Reetu Aggarwal |
| 2. | Dr. Manish Kumar<br>Department of Biology | Co-convener | Manish Kumar |
| 3. | Mrs. Rajni Gupta<br>Department of Chemistry | Member | Rajni Gupta |
| 4. | Dr. Amardeep Kaur<br>Department of Biology | Member | |
| 5. | Mr. Jagjit Singh<br>Department of Punjabi | Member | Jagjeet Singh |



Principal
S.D. College, BARNALA

## Summary

The process of methodically identifying, quantifying, documenting, reporting, and analysing different aspects of environmental diversity of the college campus is known as a "green audit." Its goal is to examine environmental practices on campus and in the vicinity. Physical examination of the campus, observation, and documentation are needed in order to conduct a green audit. Green audit fosters environmental knowledge, ethical principles, and health consciousness. It enhances staff and student knowledge w.r.t environmental sustainability on campus. All higher education institutions are required by NAAC to submit an annual Green Audit Report. In addition, it is part of the higher education institutions' social obligation to make sure that they take steps to reduce their carbon footprint in order to combat global warming. Keeping this in mind, it becomes pertinent to include sustainable practices into our daily routine. SD College, Barnala believes in this as well and is working to address environmental challenges.



Principal
S.D. College, BARNALA

## About the College

S.D. College Barnala is one of the prestigious institutions and has carved a niche for itself in the field of education in the Malwa region. The college has established its reputation over the years that attracts the students from this region and is striving to fulfill its objective of turning the students into finest and well-groomed personalities ready to take on world. In the course of aspiring & achieving its goals, the college is forever forging ahead to set & achieve higher standards of excellence in the field of education. It has been a constant endeavor on the part of the college to shape the young minds to think & to dream big, for we believe that a man's dreams are an index to his greatness. In our entire endeavor, the focus is on overall development of every student to enable them to explore their full potential & to meet the challenges of life. We make concerted efforts for the holistic development of the students. A wide range of multi-dimensional activities are organized which go a long way in empowering them with self-belief, confidence in decision making and problem solving along with chiseling of soft skills. The college curriculum is oriented to bolster the physical, emotional, social & cultural needs of the students. The open and interactive approach helps in discovering & strengthening the inherent talent in the students. Activities based on participatory spirit reduce the inhibition level of the students and thus assist them in becoming aware of their potential. Our students have been performing well in sports, cultural and extra co-curricular activities. The laurels and accolades brought by them in academics, sports and cultural activities echo not only their unfettered spirit but bear a testimony to the diligence of the entire S.D. family. Though we recognize the need for a global perspective in life in this fast changing scenario marked by liberalization, privatization and globalization but we are committed to impart traditional and cultural values to the students to keep them connected with their identity so that they go into the world with the strength not only to reach and excel in their professional aspirations but to remain beautiful human beings. I am very much hopeful that in times to come we will continue the journey with elevated enthusiasm and leave no stone unturned to make the educational experience of our students meaningful and relevant to the socio-economic needs of the times and to equip the young minds to continue their stride towards brilliance relentlessly channelizing their energies under the aegis of erudite faculty.

## VISION

- To become the preferred destination for the students aspiring for higher education.



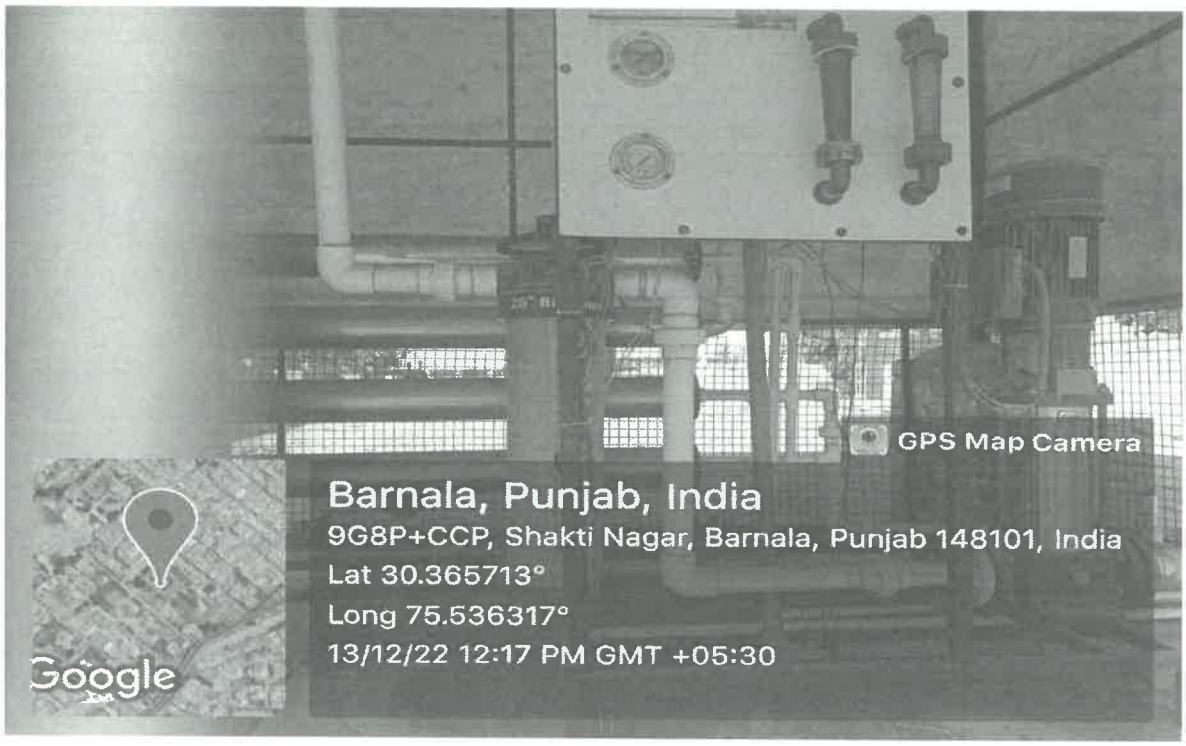
Principal
S.D. College, BARNALA

## OBSERVATIONS

### a) Water Management and Conservation:

For recharge of ground water, college has two rain harvesting systems which are successfully working. Rain water drains and harvesting systems are well maintained as regular cleaning and maintenance is carried out regularly. College also has central RO system for providing clean water for drinking purposes. The discharged RO water is channelized into washrooms and also utilized for irrigating plants growing in the campus. About 1858000 liters of water is filtered using centralized RO in the college campus during the year 2022. In the filtration process, about 2787000 liters of water is discharged. Following observations have been made for the whole year w.r.t. to RO water filtration.

| S. No. | Month | RO Capacity Per Hour (In Liters) | Usage/Month (In Hours) | Water Filtered (Estimate In Liters) | Water discharged (Estimate In Liters) |
|---|---|---|---|---|---|
| 1. | January | 2000 | 74 | 148000 | 222000 |
| 2. | February | 2000 | 75 | 150000 | 225000 |
| 3. | March | 2000 | 78 | 156000 | 234000 |
| 4. | April | 2000 | 77 | 154000 | 231000 |
| 5. | May | 2000 | 81 | 162000 | 243000 |
| 6. | June | 2000 | 78 | 156000 | 234000 |
| 7. | July | 2000 | 82 | 164000 | 246000 |
| 8. | August | 2000 | 81 | 162000 | 243000 |
| 9. | September | 2000 | 77 | 154000 | 231000 |
| 10. | October | 2000 | 76 | 152000 | 228000 |
| 11. | November | 2000 | 77 | 154000 | 231000 |
| 12. | December | 2000 | 73 | 146000 | 219000 |
| | **Total** | | 929 | 1858000 | 2787000 |




**Centralized RO in the College Campus**


**Rain Water Harvesting Pits**



Principal
S.D. College, BARNALA

- Education that will make the students sensitive, responsible and progressive so that they can shape the best future for themselves.

## MISSION

Our mission is to make sustained efforts for the multidimensional, all-round development of the students by expanding their horizon of knowledge as well as nurturing high values and social responsibility so that they can contribute their best towards the progress of the nation.

## OBJECTIVES OF THE STUDY

The Purpose of the green audit is to prioritize, identify, describe and promote the measures and activities concerning green surroundings in accordance with the applicable regulations and policies.

**The main objectives of carrying out Green Audit are:**

- To sensitize the students regarding environmental concerns and their sustainability.
- To protect the environment by highlighting and thereafter reducing the hazards posed to human health.
- To maintain a balance in the ecosystem by enhancing the sustainability of the green surroundings for the healthy survival of the living beings at micro and macro level.
- To identify and assess environmental risk.
- To increase environmental awareness throughout campus.
- To motivate staff for optimized sustainable use of available resources.
- To establish a status report on compatibility of the surroundings.

## METHODOLOGY

The process includes a variety of steps, including physical examination, observations, data analysis, and suggestions. The following issues were covered in the study viz.

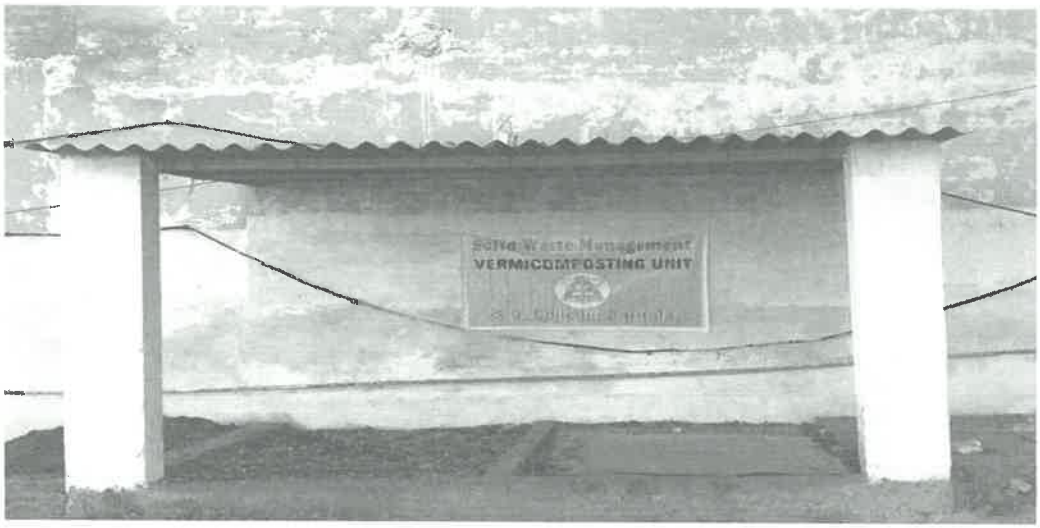
- Water management
- Waste management
- Plantation to enhance green cover
- Awareness programs

**b) Waste management:**

Campus has both biodegradable and non-biodegradable wastes in the form of canteen/departmental garbage along with dry tree leaves. By installing different dust bins for biodegradable and non-biodegradable trash, it is divided at the source. For the purpose of composting the biodegradable waste generated on the college campus, a vermicomposting pit of 12 x 8 feet has been built. During the session, 270 kg of vermicompost was produced. Vermicomposting has shown to be successful in managing solid waste at the institution and has assisted in getting the most out of waste. The campus trees and plants are nourished with the produced vermicompost. As it decreases the need for chemical fertilizers, this compost proves to be beneficial for the environment. One compost pit has been prepared in line with the recommendations made by the Green Initiatives Committee during last year. Additionally, by using the reverse side of the previously used paper for writing and printing in all departments, paper waste has been reduced. We have taken the initiative to use ceramic or china crockery at different college occasions in an effort to further limit the use of plastic. In this session, we have installed 8 new color-coded dustbins at various places in the campus, one of blue and other of green color with written information on them as biodegradable and non-biodegradable wastes.

**Table showing the estimate of vermicompost produced from biodegradable waste in vermicompost unit in the college campus.**

| S.No. | Month | Capacity of Vermicompost Unit (In Kg) | Material Added (Cow dung: Biodegradable Waste) | Vermicompost Produced (In Kg) |
|---|---|---|---|---|
| 1. | Mid-January-March | 100 | 1:1 | 60 |
| 2. | Mid-April – Mid-June | 100 | 1:1 | 69 |
| 3. | July – Mid-September | 100 | 1:1 | 74 |
| 4. | October-December | 100 | 1:1 | 67 |
| | **Total (In Kg)** | | | **270** |




**Vermicompositing Unit**

# ਐੱਸ ਡੀ ਕਾਲਜ ਦੇ ਬਾੱਟਨੀ ਵਿਭਾਗ ਨੇ ਕੈਂਪਸ ਅੰਦਰ ਕਲਰ ਕੋਡਡ ਕੂੜੇਦਾਨ ਲਗਵਾਏ


ਸੰਪਾਦਕ : * ਸਰਦੀਰ ਸਿੰਘ ਜਗਰਾਓ ਛਾਪਕ ਤੇ ਪ੍ਰਕਾਸ਼ਕ : ਸਤਿਦੇਵ ਨਾਥ ਵੈਨੇਂ ਐਸ. ਡੀ. ਕਾਲਜ ਐਜੂਕੇਸ਼ਨਲ ਸੁਸਾਇਟੀ (ਰਜਿ:) ਬਰਨਾਲਾ ਲਈ ਕਾਲਿਕਾ ਪ੍ਰਿੰਟਿੰਗ ਪ੍ਰੈਸ, ਨੇਤਾ ਜੀ ਸੁਭਾਸ਼ ਮਾਰਕੀਟ, ਪਟਿਆਲਾ ਤੋਂ ਛਾਪਕੇ ਦਫ਼ਤਰ ਐਸ. ਡੀ. ਕਾਲਜ, ਕੇ. ਸੀ. ਰੋਡ, ਨਯਦੀਕ ਰੇਲਵੇ ਫਾਟਕ, ਬਰਨਾਲਾ ਤੋਂ ਪ੍ਰਕਾਸ਼ਿਤ ਕੀਤਾ। (ਆਰ.ਐਨ.ਆਈ. ਨੰ: PUNPUN/2012/59096) (ਪੋਸਟਲ ਰਜਿ ਨੰ. PB/SR/0043) * ਪੀ.ਆਰ.ਬੀ. ਐਕਟ 1867 ਤਹਿਤ ਪ੍ਰਕਾਸ਼ਕ ਦੀ ਚੋਣ ਲਈ ਜ਼ਿੰਮੇਵਾਰ।

**Colour Coded Dustbins for Segregation of Biodegradable and Non-Biodegradable Wastes**



Principal
S.D. College, BARNALA

**c) Plantation to enhance green cover**

College campus has herbal/medicinal garden as well as an NSS park which contain variety of economical and medicinal plants. Some of the medicinal plants which have been grown successfully include, *Elletaria cardimomum, Rauwolfia serpentina, Equisetum, Plumbago zeylanicum, Carrisa carandas, Vitex negundo, Phyllanthus* sp., *Boerhaavia diffusa, Ocimum sp. Barleria lupulina*, *Vinca rosea* etc. There are more than 400 (large and small) trees growing in the college campus (Table given below). A research chapter on tree survey has been published by Dr. Manish Kumar and his team (copy attached). About 60 trees were planted in the session 2022-23. In the winter season (December 5th, 2022), we have planted around 350 ornamental plants such as *Salvia, Dimorpha, Kale, Petunia, Calendula* etc. A vertical garden has been established in the campus by NSS department as per the action plan from last session. NSS Volunteers from S.D. College initiated a project on 10th February 2023 of re-using plastic bottles. They made hanging vertical garden with used plastic bottles. The purpose of the event was to make students aware about the conservation of their environmental surrounding by using used plastic for various purposes Every month, we also observe one day as **no vehicle day** for college staff and students for reducing air pollution. Furthermore, NSS wing planted 85 saplings of various native varieties. Preference was given to the shady trees.

**Table 1. List of Trees in the campus of S.D. College, Barnala (Punjab)**

| **Botanical Name** | **Common Name** | **Family** | **No. of Individuals** |
|---|---|---|---|
| *Dalbergia sisso* Roxb. | Sisham | Fabaceae | 05 |
| *Ficus religiosa*L. | Peepal | Moraceae | 05 |
| *Putranjiva roxburghii* Wall. | Putijia | Putranjivaceae | 02 |
| *Pterospermum acerifolium* Willd. | Kanak Champa | Sterculiaceae | 03 |
| *Azadirachta indica* L. | Neem | Meliaceae | 10 |
| *Melia azedarach*Linn. | Dek | Meliaceae | 30 |
| *Albizia lebbek*Benth. | Siri | Fabaceae | 03 |
| *Cassia fistula* Linn. | Amaltas | Fabaceae | 09 |
| *Mangifera indica*L. | Amb | Anacardiaceae | 04 |



Principal
S.D. College, BARNALA

| | | | |
|---|---|---|---|
| *Moringa oleifera*Lam. | Soanjana | Moringaceae | 04 |
| *Delonix regia* (Bojer ex Hook.) Raf. | Gulmohar | Fabaceae | 02 |
| *Aegle marmelos* (L.) Corrêa. | Bael | Rutaceae | 10 |
| *Alstonia scholaris* (L.) R. Br. | Shaitan tree | Apocyanaceae | 05 |
| *Cordia dichotoma*G.Forst | Lasoora | Boraginaceae | 01 |
| *Pongamia glabra*Vent. | Karanj | Fabaceae | 14 |
| *Eucalyptus longifolia* Link & Otto | Safeda | Myrtaceae | 01 |
| *Polyalthia longifolia* Thw. | Ashok | Annonaceae | 195 |
| *Ficus benghalenesis* L. | Bargad | Moraceae | 04 |
| *Ficus racemosa* Linn. | Gular | Moraceae | 07 |
| *Tamarindus indica* L. | Imli | Febaceae | 05 |
| *Tectona grandis* Linn.f. | Sagwan | Verbenaceae | 01 |
| *Syzygium cumini* (L.) Skeels | Jamun | Myrtaceae | 06 |
| *Citrus limon* (Linn.) Burm. f. | Nimbu | Rutaceae | 01 |
| *Terminalia arjuna* (Roxb.) | Arjun | Combretaceae | 17 |
| *Terminalia bellirica* (Gaertn.) Roxb. | Bahera | Combretaceae | 04 |
| *Bauhinia variegata* L. | Kachnar | Fabaceae | 08 |
| *Callistemon lanceolatus* DC. | Cheel | Myrtaceae | 01 |
| *Madhuca longifolia* (J. Konig) J.F.Macbr. | Mahua | Sapotaceae | 01 |
| *Psidium guajava* Linn. | Amrud | Myrtaceae | 06 |
| *Vitex negundo* L. | *Sambhalu* | Lamiaceae | 01 |
| *Prosopis juliflora* (Sw.) DC. | Vilayatikikar | Fabaceae | 01 |
| *Morus alba* Linn. | Sahtoot | Moraceae | 05 |
| *Annona squamosa* L. | Sitaphal | Annonaceae | 01 |
| *Mimusops elengii* L. | Maulsari | Sapotaceae | 05 |
| *Ailanthus altissima* (Mill.) Swingle | Maharukh | Simaroubaceae | 03 |
| *Murraya exotica* Linn., | Kamini | Rutaceae | 02 |
| *Murraya koenigii* (Linn.) Spreng. | Curry Patta | Rutaceae | 03 |
| *Punica granatum*Linn. | Pomegranate | Punicaceae | 02 |
| *Kigelia pinnata* DC. | Balamkheera | Bignoniaceae | 06 |



Principal
S.D. College, BARNALA

| | | | |
|---|---|---|---|
| *Citrus reticulata* L. | Santra | Rutaceae | 02 |
| *Phyllanthus emblica* L. | Amla | Phyllanthaceae | 08 |
| *Citrus pseudolimon* Tan. | Galgal | Rutaceae | 01 |


**Plantation Drive carried out in the campus (5th Dec. 2022)**



Principal
S.D. College, BARNALA

**d. Awareness Programs**

Several awareness programs have been organized by college to aware students, faculty and nearby villagers to sensitize them regarding serious concerns of environmental degradation and steps to overcome these. On 19th October 2022 NSS Wing of S.D. College took out an awareness rally against stubble burning in the NSS adopted villages Phawahi and Rajgarh. volunteers met farmers and tried to dissuade them to indulge in stubble burning by narrating the serious health and soil hazards it poses and tried to convince them to use alternative methods like Happy Seeder etc. NSS wing of S.D. College organized a seven day and night camp in its adopted village Pharwahi from 4th April 2023 to 10th April 2023. Under the theme "Swachh Bharat Abhiyaan" the volunteers in the camp took up the project of village cleanliness and after cleaning and clearing village wasteland planted a Mini Jungle by planting 100 trees of indigenous variety. The volunteers sensitized the villagers for environment conservation by enacting a Nukkad Natak in the Govt. School premises of village and made them aware about cleanliness of their surrounding by taking out a rally in the village

## ACTION PLANS

- Extension of Vertical Garden by reusing plastic bottles and containers which would lead to reduction of plastic waste and an addition to the green area in the college premises.
- Every month, one day will be observed as no vehicle day for college staff and students that would reduce air pollution.
- More composting pits will be prepared for the management of solid waste.
- Unused space in the college campus will be used for more and more plantation.
- Separate containers will be used in the labs for discharging used chemicals instead of spilling them in sinks.
- More awareness program will be organized to sensitize faculty and students w.r.t. environment.

## CONCLUSION

Faculty and students have a high level of environmental awareness, and they have taken considerable green measures. The establishment of botanical garden, vermicomposting pit and


**Plantation Drives carried out in the campus (5th June. 2023)**

**Students preparing pots from plastic bottles for vertical garden (10th February 2023)**



Principal
S.D. College, BARNALA

rain harvesting units in the campus is an important step towards the environment awareness. A few action plans will be recommended by the committee will surely reduce biodegradable and non-biodegradable waste, and will promote green areas and pollution free environment in the college campus.

Principal
S.D. College, BARNALA

# Action Taken Report
# (Session 2022-2023)

**S. D. College, Barnala is committed to preserve and improve the environment by leveraging sustainable, eco-friendly, and environmentally safe practices and alternatives such as**

- Established a Vertical Garden by reusing plastic bottles and containers which reduces plastic waste and acts as a green area in the college premises.
- Every month, one day is observed as no vehicle day for college staff and students to reduce air pollution.
- Vermicomposting and compost pits are established for the management of solid waste.
- More plants have been planted in the campus for green landscaping.
- Installed 8 new color-coded dustbins at various places in the campus, one of blue and other of green colour with written information on them as biodegradable and non-biodegradable wastes for waste segregation.
- More awareness programs have been organized to sensitize faculty and students w.r.t. environment.
- All the computer monitors have been replaced with LED/LCD displays. Screen saver facility implemented for every computer.
- Heaters in labs have been replaced with LPG cylinder.
- Installed Main filter for RO in place of multiple filters.
- College is using waste water of R.O system to fill the water tanks for flushing in washrooms.
- Replacement of the existing conventional lighting with the LED.
- Establishment of energy efficient utilization measures in the supply, demand systems as part of energy management of the campus.
- Monitor the electricity bills for the efficient utilization of solar power plant installed in the campus.
- The staff members and students take initiatives to save significant electricity and have developed a policy for reducing electricity consumption.
- Directions are given to students for the proper utilization of the electronic devices in the institution and it is ensured all the institutional electronics are turned off when not in use.

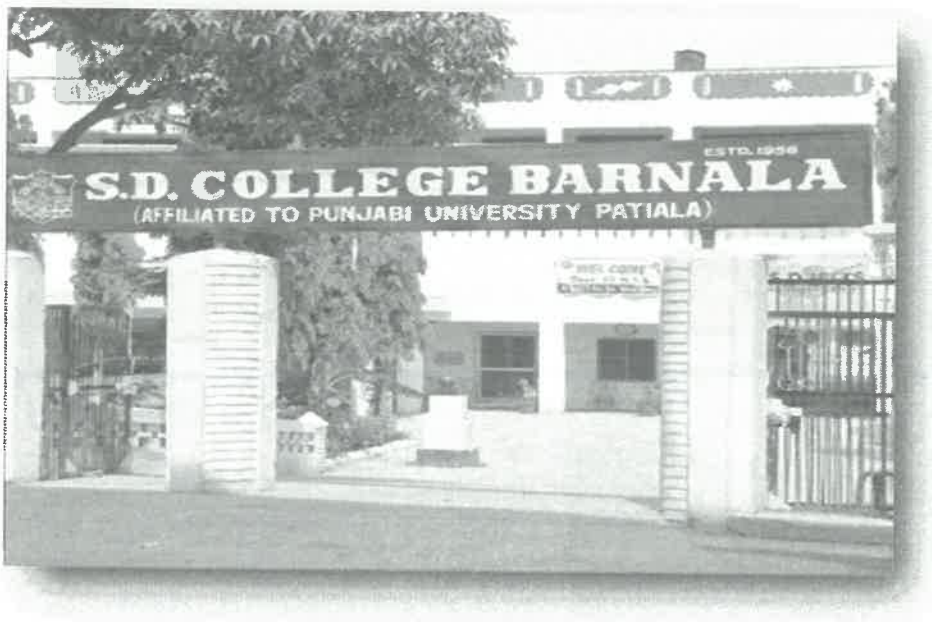
Principal
S.D. College, BARNALA

- Replacement of some old appliances with energy-efficient appliances is underway.
- Use of energy efficient devices with high stars.

Principal
S.D. College, BARNALA

# *GREEN AUDIT REPORT*

## Session: 2021-22




**PREPARED BY:**

## GREEN INITIATIVES COMMITTEE
## S.D. College, Barnala
## Punjab (India)

## Audit Date: 15 July 2022



Principal
S.D. College, BARNALA

# Green Initiatives Committee
## S.D. College, Barnala

| Sr. No. | Name & Designation | Capacity | |
|---|---|---|---|
| 1. | Dr. Reetu Aggarwal<br>Associate Professor in English | Convenor | Reetu Aggarwal |
| 2. | Dr. Manish Kumar<br>Assistant Professor in Botany | Co-convenor | Manish Kumar |
| 3. | Mrs. Rajni Gupta<br>Associate Professor in Chemistry | Member | Rajni Gupta |
| 4. | Dr. Amardeep Kaur<br>Assistant Professor in Botany | Member | Amardeep |
| 5. | Mr. Jagjit Singh<br>Assistant Professor in Punjabi | Member | Jagjeet Singh |

Principal
S.D. College, BARNALA
Reetu

# CERTIFICATE

This is to certify that an **"Green Audit"** (Session 2021-22) for S.D. College, Barnala has been conducted in July 2022 to assess green practises followed by the college and to determine where we stand on an environmental soundness scale.

**Place:** Barnala

**Date:** 15 July 2022

Dr. Reetu Aggarwal

**Convenor**

Dr. Manish Kumar

**Co-convenor**

Principal
S.D. College, BARNALA

# Summary

Globally, unchecked urbanization has accelerated the rate of environmental deterioration, resulting in a wide range of issues including land insecurity, deteriorating water quality, excessive air pollution, noise, and issues with waste disposal. We are approaching a worldwide "Environmental Poverty" due to the increasing environmental degradation at the local, regional, and global levels. The stabilisation of the human population, the use of environmental friendly and sustainable technology, reforestation, and ecological restoration are essential steps in ensuring that all people may live in peace with nature and the environment and have a sustainable future. Keeping this in mind, it becomes pertinent to include sustainable practices into our daily routine. SD College, Barnala believes in this as well and is working to address environmental challenges.

Green auditing is the process of finding and evaluating whether an institution's operations are sustainable and favourable to the environment. The primary goal of conducting a green audit is to assess the college's adherence to green practises and prepare a thorough audit report that will help us determine where we stand in terms of environmental soundness. Physical examination, observations, data analysis, recommendations etc. are all part of the method. It emphasizes a range of issues, including solid waste management, expanding green spaces through plantations, and conserving water.

Principal
S.D. College, BARNALA

# About the College

S.D. College Barnala is one of the prestigious institutions and has carved a niche for itself in the field of education in the Malwa region. The college has established its reputation over the years that attracts the students from this region and is striving to fulfill its objective of turning the students into finest and well groomed personalities ready to take on world. In the course of aspiring & achieving its goals, the college is forever forging ahead to set & achieve higher standards of excellence in the field of education. It has been a constant endeavor on the part of the college to shape the young minds to think & to dream big, for we believe that a man's dreams are an index to his greatness. In our entire endeavor, the focus is on overall development of every student to enable them to explore their full potential & to meet the challenges of life. We make concerted efforts for the holistic development of the students. A wide range of multi-dimensional activities are organized which go a long way in empowering them with self-belief, confidence in decision making and problem solving along with chiseling of soft skills. The college curriculum is oriented to bolster the physical, emotional, social & cultural needs of the students. The open and interactive approach helps in discovering & strengthening the inherent talent in the students. Activities based on participatory spirit reduce the inhibition level of the students and thus assist them in becoming aware of their potential. Our students have been performing well in sports, cultural and extra co-curricular activities. The laurels and accolades brought by them in academics, sports and cultural activities echo not only their unfettered spirit but bear a testimony to the diligence of the entire S.D. family. Though we recognize the need for a global prospective in life in this fast changing scenario which is marked by liberalization, privatization and globalization but we are committed to impart traditional and cultural values to the students to keep them connected with their identity so that they go into the world with the strength not only to reach and excel in their professional aspirations but to remain beautiful human beings. We are very much hopeful that in times to come we will continue the journey with elevated enthusiasm and leave no stone unturned to make the educational experience of our students meaningful and relevant to the socio-economic needs of the times and to equip the young minds to continue their stride towards brilliance relentlessly channelizing their energies under the aegis of erudite faculty.



Principal
S.D. College, BARNALA

## OBJECTIVES OF THE GREEN AUDIT

We have a reputation for being wise and effective consumers of natural resources. However, excessive use of resources like electricity, water, and chemicals has been ingrained in everyone through time. Now it's important to determine if our activities are using more resources than necessary. Whether we are being careful while processing waste or not? All such actions are regulated by green audit, which also provides an effective method for utilising natural resources. The Purpose of the green audit is to prioritize, identify, describe and promote the measures and activities concerning green surroundings in accordance with the applicable regulations and policies.

**The green audit is carried out by keeping in view the following objectives:**

- To sensitize the students regarding environmental concerns and their sustainability.
- To safeguard the environment by drawing attention to various environmental issues and subsequently lowering the risks to human health.
- To keep the ecosystem in balance by improving the sustainability of the natural surroundings for the healthy coexistence of micro- and macro-organisms.
- Identification and documenting the green policies of the college.

## METHODOLOGY

Physical examination, observations, data analysis, recommendations etc. are all part of the method. The following issues were covered in the study *viz.*

- Water management
- Waste management
- Plantation to enhance green cover

## OBSERVATIONS

**a) Water Management and conservation:**

College has installed two rainwater harvesting systems that replenish the groundwater. Further for efficient working of these rain harvesting pits, regular maintenance and cleanliness is carried out. In the year 2021, the centralised RO of the college filtered about 18,40,000 litres of water. In this filteration process of RO, approximately 27,48,000 litres of water is released as a discharged



Principal
S.D. College, BARNALA

water. This discharged water from centralized ROS system is redirected into toilet tanks and used to irrigate garden plants as a further measure to reduce water wastage. Although using RO is not environment friendly but for the benefits of health its usage has become necessity. Therefore to reduce the wastage of water with clogging of RO filters, regular maintenance is carried out after every month. Regarding RO water filtration, the following observations have been taken throughout the year.

| S.No. | Month | RO Capacity Per Hour (In Litres) | Usage/Month (In Hours) | Water Filtered (Estimate In Litres) | Water discharged (Estimate In Litres) |
|---|---|---|---|---|---|
| 1. | January | 2000 | 71 | 152000 | 213000 |
| 2. | February | 2000 | 73 | 148000 | 219000 |
| 3. | March | 2000 | 75 | 154000 | 225000 |
| 4. | April | 2000 | 78 | 152000 | 234000 |
| 5. | May | 2000 | 81 | 160000 | 243000 |
| 6. | June | 2000 | 74 | 142000 | 222000 |
| 7. | July | 2000 | 82 | 162000 | 246000 |
| 8. | August | 2000 | 81 | 160000 | 243000 |
| 9. | September | 2000 | 77 | 152000 | 231000 |
| 10 | October | 2000 | 76 | 154000 | 228000 |
| 11 | November | 2000 | 75 | 156000 | 225000 |
| 12 | December | 2000 | 73 | 148000 | 219000 |
| | **Total** | | **916** | **1840000** | **2748000** |


**Rain Water Harvesting Pits**



Principal
S.D. College, BARNALA

**b) Waste management:**

Along with being non-biodegradable, the main solid waste sources on college campus are canteen garbage and tree leaves. By providing separate dustbins for biodegradable and non-biodegradable garbage, it is divided at the source. For the purpose of composting the biodegradable waste generated on the college campus, a vermicomposting pit of 12 x 8 feet has been built. During the session, 275 kg of vermicompost was produced (Table given below). Vermicomposting has shown to be successful in managing solid waste at the institution. The trees and plants on the campus are nourished by the vermicompost that has been created in this manner. As it decreases the usage of synthetic fertilisers, this compost proves to be beneficial for the environment. Therefore, a new compost pit has been added. Further with persisting endeavors of faculty and students, efforts have been made to minimize the generation of waste material in the college campus.

**Table showing the estimate of vermicompost produced from biodegradable waste in vermicompost unit in the college campus.**

| S.No. | Month | Capacity of Vermicompost Unit (In Kg) | Material Added (Cow dung: Biodegradable Waste) | Vermicompost Produced (In Kg) |
|---|---|---|---|---|
| 1. | Mid-January-March | 100 | 1:1 | 63 |
| 2. | Mid-April – Mid-June | 100 | 1:1 | 72 |
| 3. | July – Mid-September | 100 | 1:1 | 71 |
| 4. | October-December | 100 | 1:1 | 69 |
| | **Total (In Kg)** | | | **275** |

Principal
S.D. College, BARNALA


**Vermicompositing Unit**

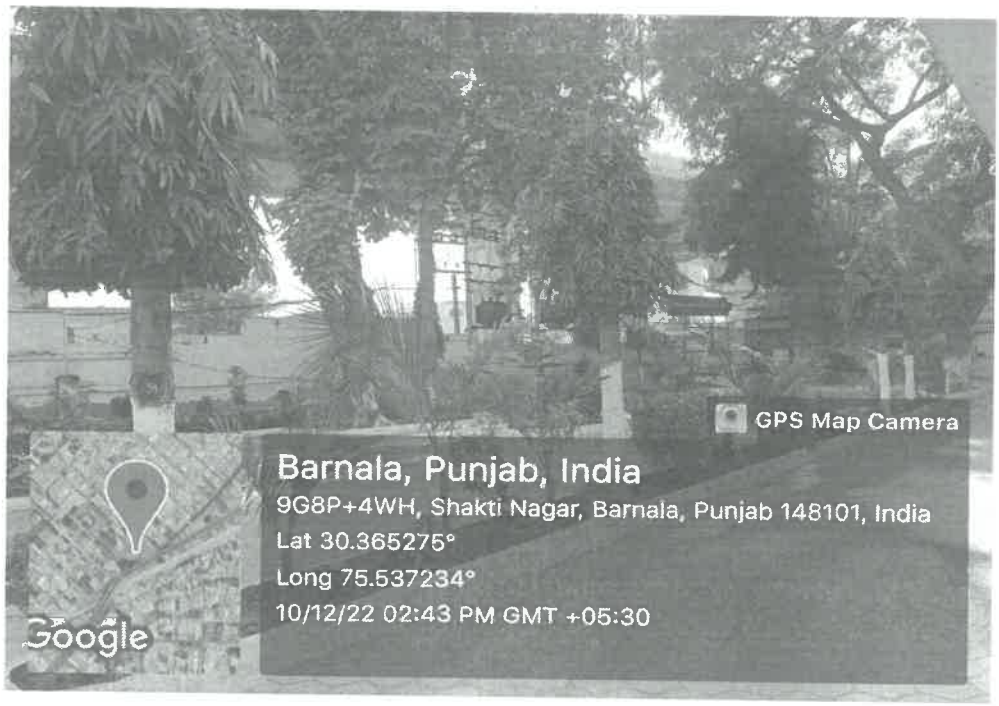
**c) Plantation to enhance green cover**

The Institution has created a botanical/herbal garden to create efficient ecosystem in the campus. Students, faculty and supporting staff have planted some herbal/medicinal plants in a selected area. Different species of herbs/medicinal plants have been grown successfully that include *Calotropis procera, Elletaria cardimomum, Rauwolfia serpentina, Equisetum, Plumbago zeylanicum, Carrisa carandas, Vitex negundo, Phyllanthus* sp., *Boerhaavia diffusa, Ocimum sp. Asparagus*, *Vinca rosea* etc. There are more than 400 trees in the college campus belonging to 42 species. The dominating families of trees are fabaceae and rutaceae. Some of the trees which are growing in the campus include *Dalbergia sisso, Ficus religiosa Putranjiva roxburghii, Pterospermum acerifolium, Azadirachta indica, Melia azedarach, Albizia lebbek, Cassia fistula,*



Principal
S.D. College, BARNALA

*Mangifera indicaL, Moringa oleifera, Delonix regia, Aegle marmelos, Alstonia scholaris, Cordia dichotoma, Pongamia glabra, Eucalyptus longifolia, Polyalthia longifolia, Ficus benghalenesis, Tamarindus indica, Tectona grandis,* Syzygium cumini, Citrus limon etc. Medicinal and flowering plants/trees growing in the garden/campus attract numerous insects/birds which play a crucial role in maintaining balance in the ecosystem. This garden not only benefits students in their course of study and research but also benefits local community as it provides required medicinal herbs to the people. More than 100 ornamental plants were planted in December 2021. About 25 trees were planted in the march 2022. Further celebrating World Environment day, students & faculty members donated and planted 125 potted plants and trees in June 2022. As per the action plans of last session, installation of vertical garden is in process. One of the recommendations of the green audit committee in the action plan of last session, NO VEHICLE DAY has been implemented and is observed quarterly.




**Photograph showing trees growing in the campus**

Principal
S.D. College, BARNALA

**Botany students during field visits in botanical/medicinal garden**

## ACTION PLANS

- Recommendations are given for extension of Vertical Garden by reusing plastic bottles and containers to other areas of the college campus.
- More ornamental plants should be planted in unused areas of the campus.
- Adoption of plants by students and faculty should be done for better care of plants.

## CONCLUSION

A high degree of environmental awareness exists among faculty and students, and they have implemented several green practises. An essential step in raising environmental consciousness on campus is the installation of a botanical garden, a vermicomposting pit, composting, vertical gardens, and rain collecting units. The committee's suggested action plans would undoubtedly minimise biodegradable and non-biodegradable waste, encourage the development of green spaces, and create a pollution-free atmosphere on the college campus.



Principal
S.D. College, BARNALA

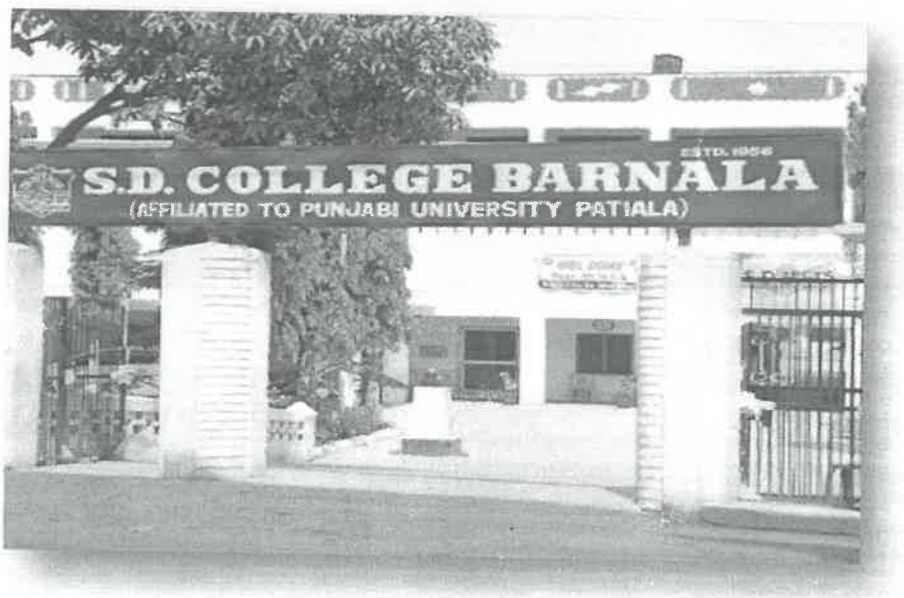
**S.D. College, Barnala,**

**Punjab (India)**

**Affiliated to Punjabi University Patiala, Punjab (India)**

# *GREEN AUDIT REPORT*

**Session: 2020-21**




Principal
S.D. College, BARNALA

# Green Audit Committee
## S. D. College, Barnala

| Sr. No. | Name & Designation | Capacity | |
|---|---|---|---|
| 1. | Dr. Reetu Aggarwal<br>Department of English | Convenor | Reetu Aggarwal |
| 2. | Dr. Manish Kumar<br>Department of Biology | Co-convenor | Manish Kumar |
| 3. | Mrs. Rajni Gupta<br>Department of Chemistry | Member | Rajni Gupta |
| 4. | Dr. Amardeep Kaur<br>Department of Biology | Member | |
| 5. | Mr. Jagjit Singh<br>Department of Punjabi | Member | Jagjeet Singh |

Principal
S.D. College, BARNALA

## Summary

The basic issue that is arising as a result of population expansion, poorly planned urbanisation, and changes in social behaviour is resource scarcity. Due to increased consumption, natural resources appear to have lost their renewability. The pace of consumption is substantially higher than the rate of production, resulting in a severe scarcity of resources. This has resulted in a slew of environmental challenges, some of which might lead to an ecological imbalance. Keeping this in mind, it becomes pertinent to include sustainable practices into our daily routine. SD College, Barnala believes in this as well and is working to address environmental challenges.

The Purpose of the audit is to prioritize, identify, describe and promote the measures and activities concerning green surroundings in accordance with the applicable regulations and policies. Physical examination, observations, data analysis, recommendations etc. are all part of the method. It focuses on a variety of issues such as water conservation, extension of green areas by plantation, solid waste management, etc.


Principal
S.D. College, BARNALA

## About the College

S.D. College Barnala is one of the prestigious institutions and has carved a niche for itself in the field of education in the Malwa region. The college has established its reputation over the years that attracts the students from this region and is striving to fulfill its objective of turning the students into finest and well groomed personalities ready to take on world. In the course of aspiring & achieving its goals, the college is forever forging ahead to set & achieve higher standards of excellence in the field of education. It has been a constant endeavor on the part of the college to shape the young minds to think & to dream big, for we believe that a man's dreams are an index to his greatness. In our entire endeavor, the focus is on overall development of every student to enable them to explore their full potential & to meet the challenges of life. We make concerted efforts for the holistic development of the students. A wide range of multi-dimensional activities are organized which go a long way in empowering them with self-belief, confidence in decision making and problem solving along with chiseling of soft skills. The college curriculum is oriented to bolster the physical, emotional, social & cultural needs of the students. The open and interactive approach helps in discovering & strengthening the inherent talent in the students. Activities based on participatory spirit reduce the inhibition level of the students and thus assist them in becoming aware of their potential. Our students have been performing well in sports, cultural and extra co-curricular activities. The laurels and accolades brought by them in academics, sports and cultural activities echo not only their unfettered spirit but bear a testimony to the diligence of the entire S.D. family. Though we recognize the need for a global prospective in life in this fast changing scenario marked by liberalization, privatization and globalization but we are committed to impart traditional and cultural values to the students to keep them connected with their identity so that they go into the world with the strength not only to reach and excel in their professional aspirations but to remain beautiful human beings. I am very much hopeful that



Principal
S.D. College, BARNALA

in times to come we will continue the journey with elevated enthusiasm and leave no stone unturned to make the educational experience of our students meaningful and relevant to the socio-economic needs of the times and to equip the young minds to continue their stride towards brilliance relentlessly channelizing their energies under the aegis of erudite faculty.

## VISION

- To become the preferred destination for the students aspiring for higher education.
- Education that will make the students sensitive, responsible and progressive so that they can shape the best future for themselves.

## MISSION

Our mission is to make sustained efforts for the multidimensional, all round development of the students by expanding their horizon of knowledge as well as nurturing high values and social responsibility so that they can contribute their best towards the progress of the nation.

## OBJECTIVES OF THE STUDY

The Purpose of the green audit is to prioritize, identify, describe and promote the measures and activities concerning green surroundings in accordance with the applicable regulations and policies.

**The green audit is carried out by keeping in view the following objectives:**

- To sensitize the students regarding environmental concerns and their sustainability.
- To protect the environment by highlighting and thereafter reducing the hazards posed to human health.
- To maintain a balance in the ecosystem by enhancing the sustainability of the green surroundings for the healthy survival of the living beings at micro and macrolevel.



Principal
S.D. College, BARNALA

- To establish a status report on compatibility of the surroundings.

## METHODOLOGY

Physical examination, observations, data analysis, recommendations etc. are all part of the method. The following issues were covered in the study viz.

- Water management
- Waste management
- Plantation to enhance green cover

## OBSERVATIONS

**a) Water Management and conservation:**

The College has set up two rainwater harvesting plants in the campus which recharge the groundwater. Further to curb the water wastage, discharghed RO water is channelized into lavatory tanks and utilized for irrigating garden plants. About 1,840,000 litres of water is filtered using centralized RO in the college campus during the year 2020. In the filteration process, about 27,60,000 litres of water is discharged. Following observations have been made for the whole year w.r.t. to RO water filtration.

| S.No. | Month | RO Capacity Per Hour (In Litres) | Usage/Month (In Hours) | Water Filtered (Estimate In Litres) | Water discharged (Estimate In Litres) |
|---|---|---|---|---|---|
| 1. | January | 2000 | 76 | 152000 | 228000 |
| 2. | February | 2000 | 74 | 148000 | 222000 |
| 3. | March | 2000 | 77 | 154000 | 231000 |
| 4. | April | 2000 | 76 | 152000 | 228000 |
| 5. | May | 2000 | 80 | 160000 | 240000 |
| 6. | June | 2000 | 71 | 142000 | 213000 |
| 7. | July | 2000 | 81 | 162000 | 243000 |
| 8. | August | 2000 | 80 | 160000 | 240000 |
| 9. | September | 2000 | 76 | 152000 | 228000 |
| 10 | October | 2000 | 77 | 154000 | 231000 |
| 11 | November | 2000 | 78 | 156000 | 234000 |
| 12 | December | 2000 | 74 | 148000 | 222000 |
| | **Total** | | **931** | **1840000** | **2760000** |



Principal
S.D. College, BARNALA

**Rain Water Harvesting Pits**

**b) Waste management:**

Waste generated from canteen and tree leaves is major solid waste in the college premises besides non-biodegradable. It is segregated at source by providing separate dust bins for biodegradable and non-biodegradable waste. A vermicomposting pit (measuring 12x8 Ft) has been constructed to decompose the biodegradable waste of the college campus. About 274 kg of vermicompost have been produced in the session (Table given below). Vermicomposting has helped the college to get best out of waste and has been proved to be effective in solid waste management. The vermicompost thus prepared is used to nourish the plants and trees of the campus. This compost proves to be a boon for the environment as it reduces the use of chemical fertilizers. In addition, paper wastage has been slashed by using the other side of the already used paper for writing and printing in all departments. Further to reduce the usage of plastic, we have taken initiative of using ceramic or china crockery in the various college functions.



Principal
S.D. College, BARNALA

**Table showing the estimate of vermicompost produced from biodegradable waste in vermicompost unit in the college campus.**

| S.No. | Month | Capacity of Vermicompost Unit (In Kg) | Material Added (Cow dung: Biodegradable Waste) | Vermicompost Produced (In Kg) |
|---|---|---|---|---|
| 1. | Mid-January-March | 100 | 1:1 | 65 |
| 2. | Mid-April – Mid-June | 100 | 1:1 | 70 |
| 3. | July – Mid-September | 100 | 1:1 | 71 |
| 4. | October-December | 100 | 1:1 | 68 |
| | **Total (In Kg)** | | | **274** |


**Vermicompositing Unit**

**c) Plantation to enhance green cover**

The Institution has created a botanical/herbal garden to create efficient ecosystem in the campus. Students, faculty and supporting staff have planted some herbal/medicinal plants in a selected area. Different species of herbs/medicinal plants have been grown successfully that include *Calotropis procera, Elletaria cardimomum, Rauwolfia serpentina, Equisetum, Plumbago*

*zeylanicum, Carrisa carandas, Vitex negundo, Phyllanthus* sp., *Boerhaavia diffusa, Ocimum sp. Barleria lupulina, Vinca rosea* etc (Table given below). There are 391 trees in the college campus. 30 more trees were planted in the session 2020-21. These herbal/medicinal plants are extremely useful in various ailments such as headache, cough, asthma, inflammation, hypertension, cancer, jaundice, kidney problem, indigestion, memory enhancement, etc. These herbs are good in taste, easy to grow and magnet for bees and butterflies. This garden not only benefits students in their course of study but also benefits local community as it provides required herbs to the people. Further, college is having an Ecoclub under which various activities such as installation of nests, name plates of plants were carried out time to time.

**Botanical Garden**

Principal
S.D. College, BARNALA

**Summarized table showing number of plants species growing in the botanical garden and college campus.**

| S.No. | Plants | Number | |
|---|---|---|---|
| 1. | Angiosperms | 75 | Dicots: 67 |
| | | | Monocots: 08 |
| 2. | Gymnosperms | 04 | |
| 3. | Pteridophytes | 01 | |

## ACTION PLANS

- Establishment of Vertical Garden by reusing plastic bottles and containers which would lead to reduction of plastic waste and acts as an additional to green area in the college premises.
- Every month, one day will be observed as **no vehicle day** for college staff and students that would reduce air pollution.
- More composting pits will be prepared for the management of solid waste.
- Unused space in the college campus will be used for more and more plantation.
- More ornamental plants will be planted.
- Separate containers will be used in the labs for discharging used chemicals instead of spilling them in sinks.

## CONCLUSION

Faculty and students have a high level of environmental awareness, and they have taken considerable green measures. The establishment of botanical garden, vermicomposting pit and rain harvesting units in the campus is an important step towards the environment awareness. A few action plans will be recommended by the committee will surely reduce biodegradable and non-biodegradable waste, and will promote green areas and pollution free environment in the college campus.

Rama Sharma

Digitally signed by Rama Sharma
Date: 2023.11.04 14:11:49 +05'30'

Principal
S.D. College, BARNALA

Principal S D College Barnala