Report of Green Initiative

AUDIT REPORT:

The base of any green audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions, activities, events, and procedures to ensure that they are carried out according to systems requirements and in the correct manner.
The objectives of the green audits can be attained only if they are carried out at defined intervals and their results can illustrate improvement or change over time. Although green audits are carried out using policies, procedures, documented systems and objectives as a test, there is always an element of subjectivity in an audit. The essence of any green audit is to find out how well the environmental organisation, environmental management and environmental equipment are performing. Each of the three components are crucial in ensuring that the organisation's environmental performance meets the goals set in its green policy. The individual functioning and the success of integration always play a role in the degree of success or failure of the organisation's environmental performance.

1. Analysis of air quality management.

Burning of fossil fuels is the main source and cause of carbon dioxide release to the atmosphere the different sources of carbon dioxide emitted to our college are vehicles, refrigerator, air conditioners and burning of waste. There are more than 500 different type of vehicle (Cars, Scooty and bikes etc.) in college campus. These vehicles release high amount of carbon dioxide in the surrounding.

Green initiatives to reduce carbon footprint:

In total, based on our data collected, there are approximately1372 plants in the college campus. These plants in college release a lot of oxygen in the campus and maintaining healthy environment in the college. Being situated in the urban area, our college is exposed to various atmospheric pollutants from vehicles as well as by other external means. Also, the institution organizes various programmes to create awareness among students in the campus and involve them in maintaining eco-friendly environment. College in each academic year organise various awareness programms through NSS, RRC, YRC and other clubs. In the college campus, slogan like "Go green" "Think Green", "Create Green" and "Save Green" are displayed. Under the Swachh Bharat Abhiyan, the students are always advised to make proper use of dustbins for neat, clean and green campus. The Environment Club of the college monitors the cleanliness of the campus.

Tree benefit analysis and Carbon sequestration data

For the tree benefit analysis of the college campus and to assess the environmental and climatic effects of college campus*i-Tree canopy v 7.0 digital software* was used. i-Tree Canopy is a web browser application that can be used to determine

the amount of an area of interest covered by tree canopy and other user-defined surfaces. It automatically generates random plot points within your study area boundaries. You simply visit each point and assign a land cover category to it. Land cover estimations and Tree benefit estimates are then generated statistically. The results of the report (annexure 3) are summarized in the table given below:

Table 1: Summary of the i-Tree Canopy report

S. No	Type		%/value
1.	Type of green coverage area	Trees/shrub	44.74
		Grass/herbaceous	10.53
2.	Carbon sequestration	Sequestered in trees	Co2 equivalent of 45.43T
		Stored in trees	Co2 equivalent of 1140.91T
3.	Air pollution	Co2+NO2+O3+SO2 + PM10+PM2.5	695.88lb

Green Campus

Total number of tree species identified – 45
Tree cover of the campus - 477 m2
Free space in the campus – 45866.26m2
Garden area inside the college – one acre
Total campus area – 19.84 Acres
Total number of plant species identified – 84
Tree cover of the campus – -477 m2

List of eco-friendly activities going on in the campus

- Planting and caring of trees in and around the campus.
- Timely disposal of wastes from the campus.
- Celebration of important days like World Environment Day, Ozone day, with great importance.
- Campus is declared plastic free.
- Distribution of plant saplings among students

College administration recently established small green house for greater control over the growing environment of plants. Students will be benefited academically by knowing various key factors (temperature, levels of light and shade, irrigation, fertilizer application, and atmospheric humidity) affecting growth of the plants in controlled conditions.

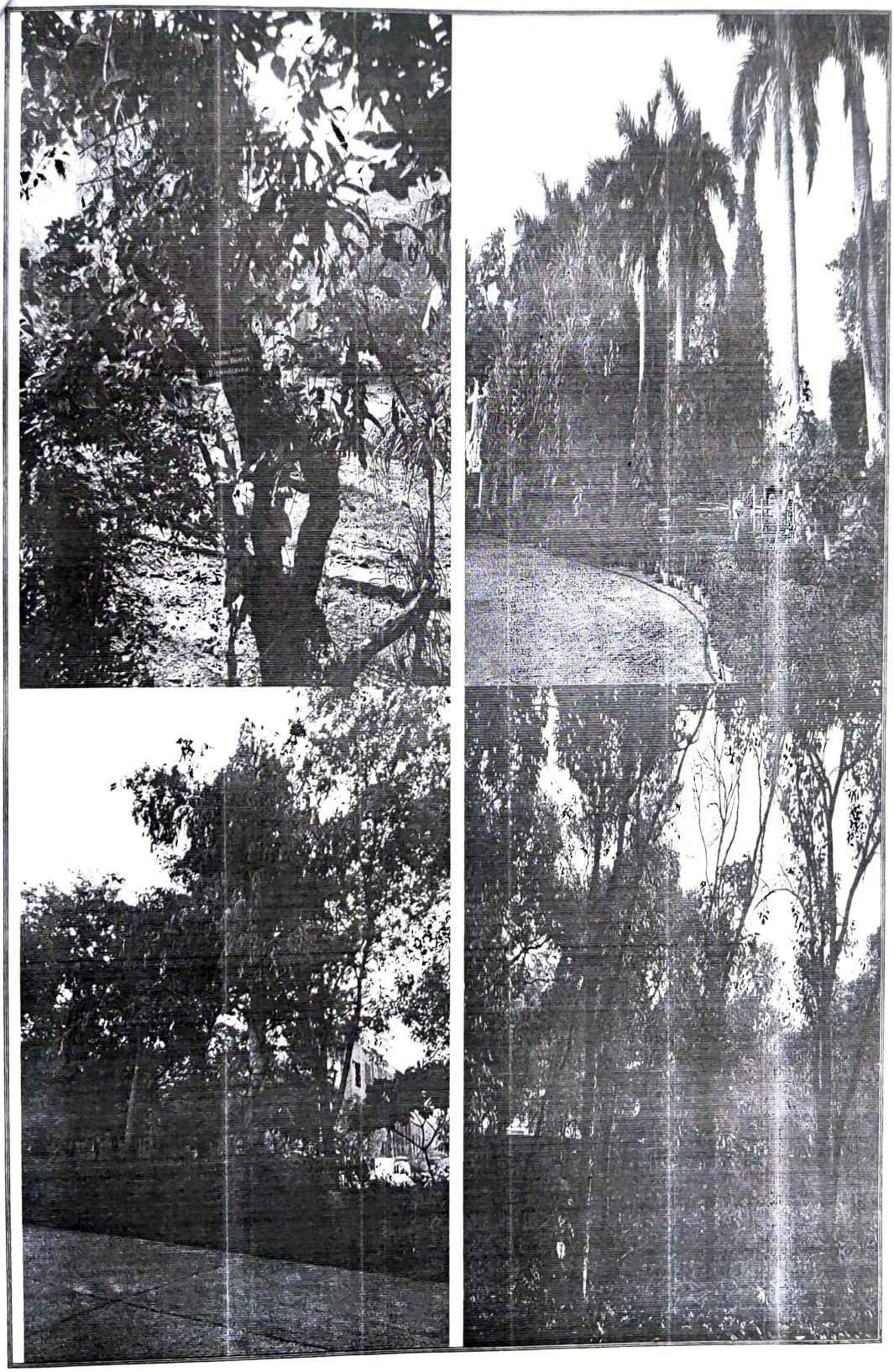

Fig. 1: Photographs showing green tree campus and landscaping

2. Analysis of Water management.

Water is a key driver and is vital to development of Biodiversity, Agriculture, Humans as well as the Economy. With recent experiences across the world and in India also, the water scarcity and security are emerging issues. Haryana government has taken serious initiative for the conservation of water and announce the Jal Shakti vision of Prime Minister and in this series, it has been decided to launch Special Water Conservation Campaign in 81 Dark Zone blocks of the 19 districts. Our college is also fully devoted for the conservation of water by adopting various procedures for maintaining and recharging underground water level.

Roof top based rain water harvesting structures in the campus:

1. In the college campus five rain water recharging wells are installed at various locations for rain water harvesting.
2. All the constructed blocks A, B, C, D and E(PG) blocks have been installed with roof-top based Rain water harvesting plants to recharge the groundwater and prevent surface run-off.
3. The instructions through assembly are given to students about the importance of water harvesting.
4. College staff and students were instructed not to waste water unnecessarily in order to avoid situation like water scarcity and drought in the absence of rainy season.
5. The run off rain water from the terrace of the college building is channelized to that well for the ground water recharge.

a) Water

❖Main water uses in the campus
Garden, Lab Cleaning, Canteen, Drinking, Toilets, Bathrooms, Hostel, Washing, Construction works, Office uses

❖Water cooler with drinking water filtration is installed (8 numbers).

❖Number of urinals and toilets – 60

❖Number of bathrooms – 15

❖Number of water taps – 35

❖Water taps in laboratories - 71

❖Number of wells – 1 tube well

❖Number of water tanks for water storage -53

❖Amount of water stored – 32*500=16000+1*10000+20*3000=60000 grand total=86000 L

r Audit

usands of litres of water are used per day by the college for its different uses. ne main source of water is ground water. Water from the public water supply is not utilized.

Table 2: Details of Various Water Utilization Activities

Activity	Average use per activity (litres)	Number of activity /day	water use/ person / day (litres)	Numb er of persons using water	Total water consumption /day (litres)
Washing hands and face	1L	1 times a day	1L	3000	3000
Bath	10-30	once	20L	10	200
Toilet flush	6-20	once	10L	2000	20000
Drinking (cup)	0.25	twice	0.5L	3000	1500
Washing dishes/clothes etc	20L	twice	100L	10	1000
Leaking/dripping tap (1 drop/ second /day)	30-60	continuous			11770
Garden use	4	once			4500
Cooking (average)	3	once	5L	20	100
Lab uses	3	once	5L	1500	7500
Total Water Usage					49570

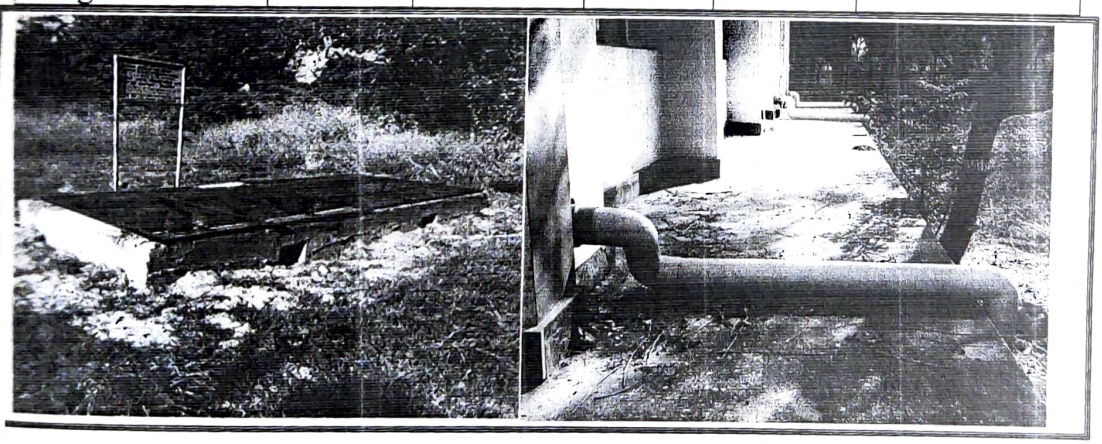

Fig. 2: Rain Water Harvesting Structures installed in the College

3. Analysis of Energy management.

The college is well equipped with electricity supply. Maximum departments possess computers, printers etc along with instruments like pathological microscope, distillation unit, photoelectric colorimeter, U V Transilluminator,2 Autoclaves, laminar air flow, hot plate, incubator, hot air oven, 2 centrifuges etc.

Energy Saved Through LED use: 2430 kWh/Month

Energy Utilization

Table 3: Details of Various Electrical Appliances and Energy Consumed

Appliances	**Wattage per appliance**	**Average hours used daily**	**Number of applianc e**	**Units consumed per month in kWh/month**
Computers and laptops	80	5	256	256*0.40*30=3072
Air conditioners	5275	3	19	19*15.83*30=9023
Photocopiers	1650	2	3	3*3.3*30=297
LED lights	40	5	673	270*0.20*30=1620
Flood light	200	6	25	25*1.20*30=900
Fans	65	3	500	500*0.20*30=3000
Televisions	200	2	7	7*0.4*30=84
Inverters	1060	6	20	20*6.36*30=3816
Power UPS/Computer Back up	4500	5	9*4.5kw	9*22.5*30=6075
Water Heaters/Geysers	1500	2	3	3*3*30=270
CCTV DVR	30	24	44	44*0.72*30=950
Total Energy usage per month (kWh)				29107

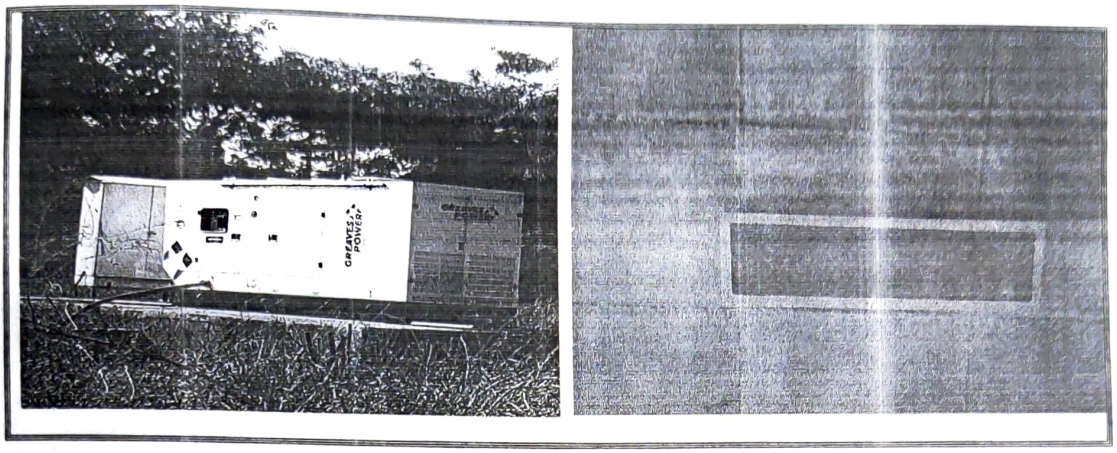

Fig. 3: Energy Saving Installations in the College (32 KVA power substation and LED Lights)

Energy saving methods adopted in the college:

- Turn off electrical equipment's when not in use
- Use energy efficient light-emitting diode (LED) bulbs instead of incandescent and CFL bulbs
- Maintain appliances and replace old appliances.
- Use computers and electronic equipment's in power saving mode.

College administration is trying to install solar panel to fulfil the energy demands of the institution and all formalities regarding the installation of the Solar system have been completed on the behalf of the College. The proposal of Solar rooftop/solar energy has been taken over by the Karnal Smart City limited **(Annexure 5)**

4. Analysis of Waste management.

Wastes cannot be avoided in any environment. Wastes can be classified as Biodegradable and Non-biodegradable wastes. Biodegradable wastes include food wastes which can be easily decomposed by the bacteria in soil. But nonbiodegradable wastes are those which cannot be degraded by any organism and remain as such for many years. Much amount of waste is generated from the college campus.

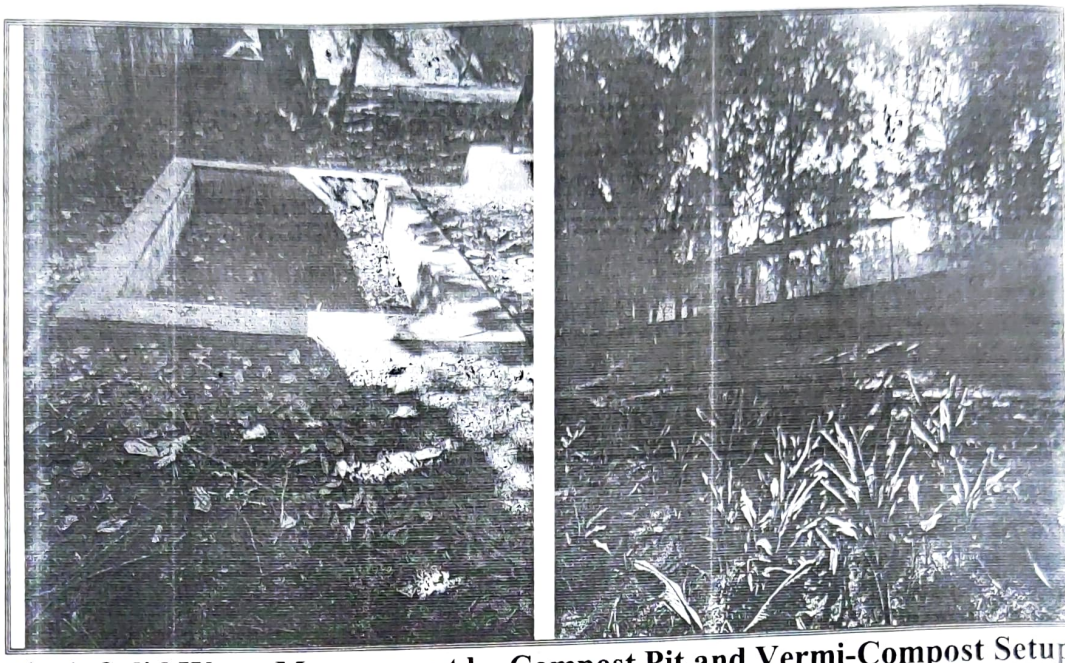

Fig 4: Solid Waste Management by Compost Pit and Vermi-Compost Setup

Solid Waste Management

1. The Single use plastic prohibition awareness programmes are regularly organized and the campus is declared as 'Single Use Plastic Free Campus'.
2. The hazardous waste from chemistry labs is properly disposed off.
3. The acid batteries and electronic instruments are disposed periodically from the lab.
4. Green Dustbins are provided at each floor entrance, near the stairs, in outside area of the college campus especially for collection of recyclable and degradable solid waste.
5. In the college campus vermin-compost pits and physical compost pit for biological waste i.e. leaf litter are operational.
6. Waste management club/ Campus beautification club for disposal of waste for maintaining cleanliness.
7. Napkin disposal machines are installed inside the campus to dispose the used napkins in the hygienic way.
8. The unused computer sets are disposed off periodically.
9. The running UPS batteries are recharged and repaired as and when required.
10. The electronic instruments in poor working conditions are disposed of properly.
11. Rain water harvesting and RO water plants are installed in the college.

E-waste management: The e-waste generated in the college is disposed of as per guidelines of Government of Haryana and directions received from Department of Higher Education, Haryana. As per rules, e-waste is stored in the college and

periodically the e-waste is handed over for disposal to the company authorised for the disposal. The last e-waste disposal was done on 19/05/2017 vide reference no MRN NO ERPL-755/A and was recycled by the company Exigo Recycling Pvt. Ltd. (Annexure 4). As per this report at total of 83 IT and related Computer Items were disposed off by the college weighting a total of 458 Kgs.

- ❖Total Stakeholders – 5000 (Student + staff + guests)
- ❖Class rooms – 50
- ❖Staff rooms - 1
- ❖Office rooms – 25
- ❖E-wastes- computers, electrical and electronic parts – Disposal by selling
- ❖Plastic waste- disposal by selling
- ❖Solid wastes – Damaged furniture, paper waste, paper plates, and food wastes – to Municipal waste collection canters
- ❖Chemical wastes – Laboratory waste – No treatment
- ❖Waste water – washing, urinals, and bathrooms in soak pits
- ❖Glass waste – Broken glass wares from the labs to municipal waste collection centres.
- ❖Napkin incinerators - 3

Dustbin
- Iron 15
- Plastic 6
- Portable 10

Quantity of waste generated-

- ❖Biodegradable – 2 kg/day (office + labs) (Approx)
- ❖Non-biodegradable – ½ kg/day (office) (Approx)
- ❖Biodegradable – 10 kg/day (campus plant waste) (Approx)
- ❖Non-biodegradable – ¼ kg/day (lab bottles etc) (Approx)

Canteen waste

- ❖Biodegradable college canteen – 20kg/day (Approx)
- ❖Non-biodegradable – ½ kg/day (Approx)

Waste

- ❖ Total Biodegradable waste = 22 kg/day (Approx)
- ❖ Non-biodegradable waste = 1 ¾ kg/day (Approx)
- ❖ Hazardous wastes = 150grams/day (Approx)
- ❖e- wastes = 458Kg disposed off on 19/5/2017

Conclusion and Full List of Recommendations

The green audit assists in the process of testing performance in the environmental arena and is fast becoming an indispensable aid to decision-making in a college. The green audit reports assist in the process of attaining an eco-friendly approach to the sustainable development of the college. Hope that the results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new activities and innovative practices. A few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus and thus sustainable environment and community development. It has been shown frequently that the practical suggestions, alternatives, and observations that have resulted from audits have added positive value to the audited organisation. An outside view, perspective and opinion often help staffs who have been too close to problems or methods to see the value of alternative approaches. A green audit report is a very powerful and valuable communications tool to use when working with various stakeholders who need to be convinced that things are running smoothly and systems and procedures are coping with natural changes and modifications that occur.

Common Recommendations

- ❖ Adopt an environmental policy for the college.
- ❖ Establish a purchase policy for environmentally friendly materials.
- ❖ Introduce the Environmental Science course for all students.
- ❖ Conduct more seminars and group discussions on environmental education.
- ❖ Students and staff should be encouraged to solve local environmental issues.
- ❖ Establish more efficient water, waste and energy management systems

Criteria Wise Recommendations

Water

- Remove damaged taps and install sensitive taps is possible.
- Drip irrigation for gardens and vegetable cultivation can be initiated.
- Establish rain water harvesting systems for each building.
- Establish water treatment systems.
- Awareness programs on water conservation to be conducted.
- Install display boards to control over exploitation of water.

Energy

- Employment of more solar panels and other renewable energy sources.
- Conduct more save energy awareness programs for students and staff.
- Replace computers and TVs with LED monitors.
- More energy efficient fans should be replaced.

☐ Observe a power saving day every year.
☐ Automatic power switch off systems may be introduced.

Waste

☐ Establish a functional bio gas plant.
☐ A model solid waste treatment system to be established.
☐ Practice of waste segregation to be initiated.
☐ Establish a plastic free campus.
☐ Avoid plastic plates and cups for all functions in the college.

Green Campus

☐ All trees in the campus should be named scientifically.
☐ Create more space for planting.
☐ Grow potted plants at both veranda and class rooms.
☐ Create automatic drip irrigation system during summer holidays.
☐ Not just celebrating environment day but making it a daily habit.
☐ Beautify the college building with indoor plants
☐ Providing funds to nature club for making campus more green
☐ Encouraging students not just through words, but through action for making the campus green
☐ Conducting competitions among departments for making students more interested in making the campus green.

Carbon footprint

☐ Establish a system of carpooling among the staff to reduce the number of four wheelers coming to the college.
☐ Introduce college bus services to the students and staff.
☐ Encourage students and staff to use cycles.
☐Discourage the students using two wheelers for their commutation.
☐ More use of generators every day should be discouraged.

4/11/22
(Dr. Ranjeet Singh)