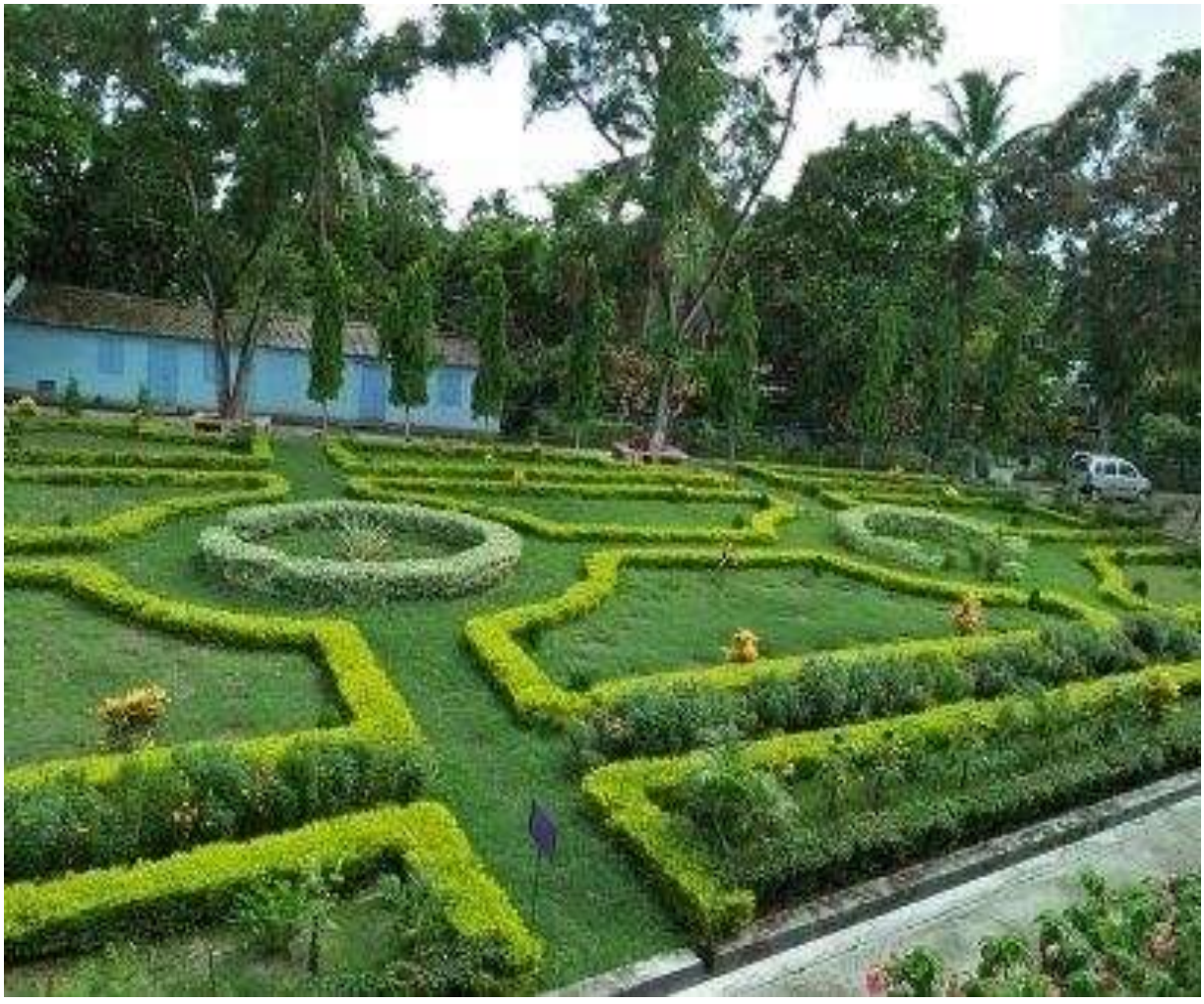
Green Audit report for the session 2018-2019

P N DAS COLLEGE

AFFILIATED TO WEST BENGAL STATE UNIVERSITY

Accredited by NAAC(Grade-B)

Santinagar, Palta, Kolkata-743122



Introduction: Colleges and Universities have broad impacts on the world around them, both negative and positive. The activities pursued by colleges can create a variety of adverse environmental impacts. But colleges are also in a unique position as educational institutions to be leaders in pursuing environmentally sustainable solutions. As a result the college campuses all over the world are shifting their attention towards a more sustainable future by redesigning the way their campus needs and wants are met. As a progressive step forward, P. N. Das College also conducted an environmental audit by the IQAC cell. Because we believe that

"Small deeds done are better than great deeds planned"

The IQAC Cell of the College conducted an internal environmental audit of the institution and takes necessary steps to promote environmental consciousness and protection. The aspects of environment-friendliness of the campus and the steps taken by the college to preserve and consolidate an eco-friendly ambience.

- are enumerated hereunder: Expenditure is incurred to retain an environment friendly campus by maintaining the already green campus and further planting more trees every year.
- The campus has very old and tall, hard wooded trees and trees like Neem, Amla, Tulsi, Turmeric, Aleovera etc. that have medicinal value. This not only enhances the greenery of the premises but turns it into a haven for a large breed of birds and other animals.
- The forest department has been approached to help us out in the matter of the same in past as well as present times.
- The college has appointed a gardener who tends the trees and plants, looks after the garden and helps the other members too to maintain a clean and eco friendly atmosphere. He works for the betterment of our green campus under the supervision of a committee constituted for the said purpose.
- The college emphasizes on conservation of energy.
- The college Promotes environmental consciousness to the society through NCC and NSS.
- The college discourages the students and faculties from carrying and using plastic bags.
- The college emphasizes on the use of dustbins in every corner of the college.
- The campus has also been earmarked as a "No Smoking Zone".
- Permanent boards are also displayed highlighting the issues on "Refuse, Reduce, Reuse and Recycle" to make the students environment conscious.

Audit Objective

In line with the audit definition, the objective of the audit is to have systematic, periodic, planned evaluation against objective evidences and reporting the results to the management as per the focus of the audit. Green Audit focuses on the basis of the environmental sustainability in terms of applicable environmental elements like Air, Water, Land, Flora, Fauna, Natural resources and Human being. The very objective of this audit is to evaluate the institutes green performance based on the focus indicators as stated above in view of the goal towards environmental

sustainability, applicable legislation, environmental policies, and standards. The green audit objectives can be stated as follows.

- To review the knowledge and awareness concerns of the institute for the journey of sustainability.
- To review the efforts made to protect the environment by preventing pollution and conserving the natural resources being used in the campus.

- To establish a baseline data to assess future sustainability and avoid heavy environmental tolls.

- To bring out a status report on environmental compliance.

- To assess the environmental performance and report it to management/authorities.

Audit methodology

The scope of the audit is divided into various environmental areas like Land use, water, effluent, sewage, energy etc. Each such area is analyzed based on the evidence produced by the institute. The evidence are collected in form of discussions/interactions, documents and records, practical site conditions and photographs of it.

Green Audit Report

1.1.**General Information**

Name : P N Das College

Address : Santinagar, Palta, P.O.-Bengal Enamel, Dist.-North 24 Pgs,Pin-743122,West Bengal

Mail Id : pndc.principal11@gmail.com **Website** : https://www.pndascollege.in/

Phone Number : +033 2592 1327

Latitude and Longitude : 22°47'2.06"N & 88°22'46.39"E

Available area of the facility : 4.285 acres

Population:

Teaching and non-teaching staff : **52** Students : **726(Female more than 50-55%)**

Facilities

a. Total built-up area around **17340.75** square meters.

b. Numerous classrooms (**20**) and office rooms(**4**) are available for variety of the classes.

c. Adequate number of sanitary facilities (**13**) separate for male candidates and female candidates, staff members(**1**),students(**4**) are available.

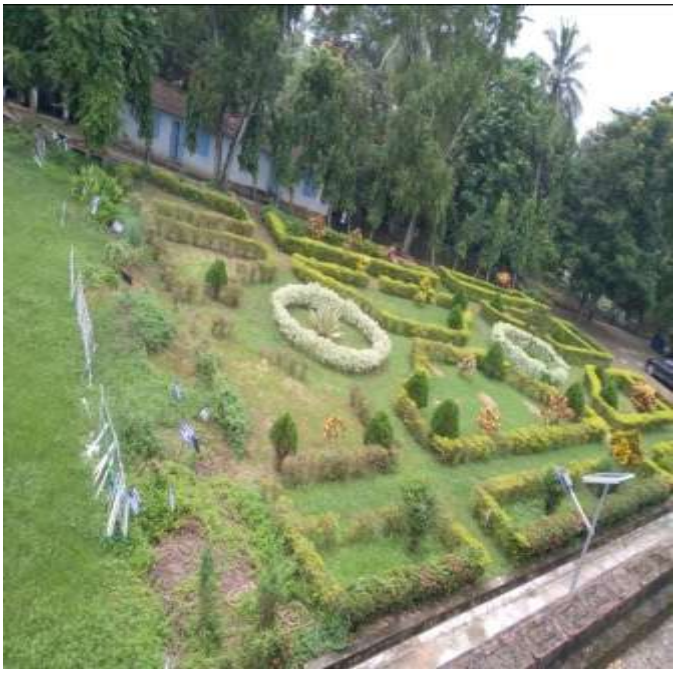
d. Number of office rooms(**4**), study rooms(**20**) are available.

e. **Two** library buildings are available with lot of books collections and chronicles.

f.**One** tube well(**6---650 ft**) and **3** wells with submerged pump is available in the campus to cope up with water shortage in the campus.

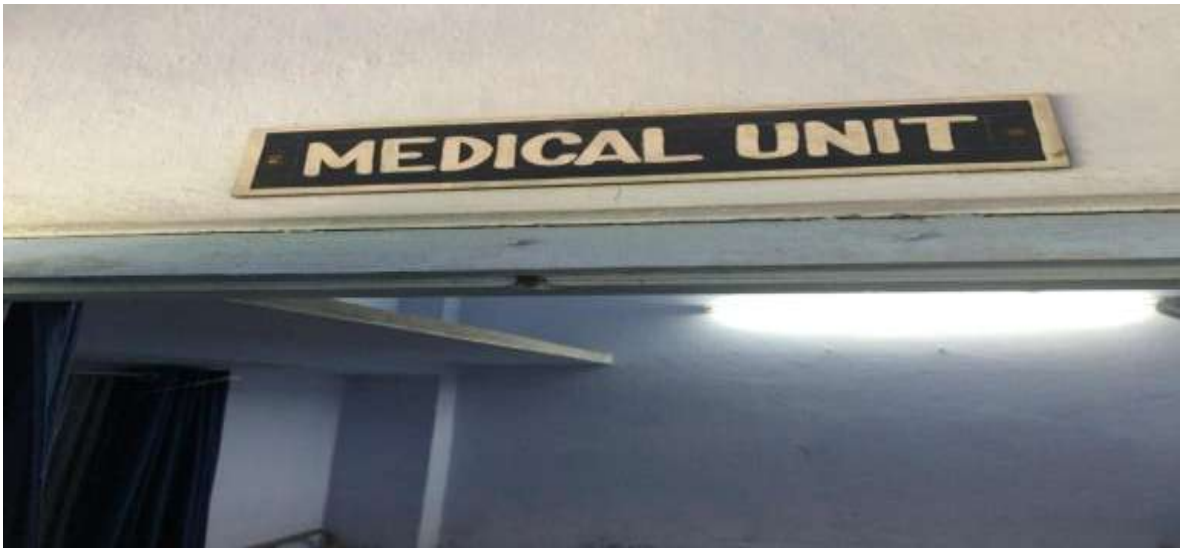
g. **Three** water cooler of **250L** and **6** water purifiers are available.

h. Total green canopy cover approximately **3000** square meter around the campus is available.



i. **S**moke detectors are available in the auditorium building of the college campus which relates to controller for detection of fire.

j. **One** medical unit and **one** skill development centre is available.



Environmental Management Program:

Annually Rs. 450000/- budget is allocated towards environmental protection and pollution prevention activities and for the last 5 years, Rs 1530726/- budget has been put up. This includes plantation, monitoring expenses, treatment recurring costs etc. In addition to this, whenever there is any specific project or capital expenditure required for environmental protection, the institute provides it as per the need.

Environmental Policy

P N Das College, Santinagar, Palta, P.O.-Bengal Enamel, Dist.-North 24 Pgs,Pin-743122,West Bengal shows its sensitivity towards the environment by establishing its environmental policy.

The aims of the policy

The policy aims to eliminate or reduce all forms of environmental pollution and encourages all faculty members, staff, students, and other stakeholders to do the same. The college always raises awareness of environmental issues among its staff/ students/ stakeholders, especially plastic pollution and encourages initiatives leading towards a clean environment. Its academic departments, NSS unit, Women Cell works towards this aim collectively.

The policy promotes the 3 R's for waste in the following order: Reduce, Reuse and Recycle and provide convenient waste collection points and guidance for the disposal of

- Paper
- Cardboard
- Glass
- Plastic

- Electrical items and white goods
- Hazardous waste
- e-waste.

The college aims to minimize the consumption of water and electricity and mainly solid waste disposal and thereby contribute to the proper use of the natural resource by the following ways:

- Encouraging to report leaks and rectifying them promptly.
- Progressively replacing/supplementing water-taps in staffroom, washroom etc. If needed.
- Exploring options for using wastewater wherever possible.
- Establishing rainwater harvesting schemes in science buildings of the campus.
- Progressive replacement of light bulbs with energy efficient ones.
- Encouraging staff, mainly students to turn off electrical appliances when not in use.
- Minimizes the consumption of electricity where opportunities arise.
- Conserving energy by promoting the use of daylight.
- Conducting frequent preventive and corrective maintenance.

Steps taken and mechanism

- The college adapts health, safety, and environments-based codes of practice and relevant guidance and complies with legislation.

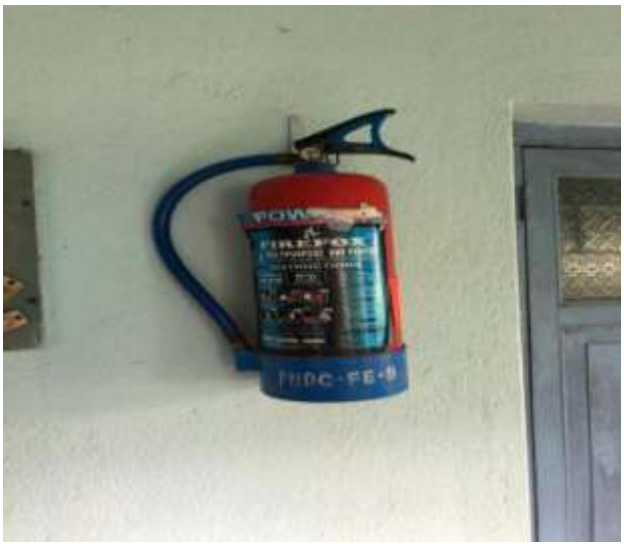
- The college has planned for Solar panel systems on the campus.

- The college campus is completely free from smoke, plastic bags, and cups.

- Waste bins are placed at appropriate locations to maintain a clean and tidy campus.

- Green initiatives are taken by developing medicinal plantation through adequate plantation by the college (NSS Unit and the maintenance cell).

a. The arrangement to set off the fire causing environmental damage by setting the fire extinguishers at different places on the premises.



1. 5.1. Observations

5.1.1 Land Use

Land and efforts for green belt development

Available land in the whole college campus is with a limit of 3000 square meter (approx.) with 900 square meter occupying garden area. Due to high crowds in the city, it is very difficult to have green belt development within the campus. However, college has still some cultivation of ornamentals in pot gardening to have rich green effect

Water Supply

The main source of water supply for the institute is a well-built overhead tank of 10500 L, rainwater harvesting system, tube well and storage tank in the college campus. Institute has installed the rainwater harvesting system for about 1000 liters capacity. The drinking water is provided through 100 liters/day water treatment facility and thereafter to the dispensers at various locations for the ease of access to the students and staff. The drinking water is periodically tested from the laboratory and ensured its portability for drinking purpose.

Energy

Energy Source

Major source of electricity in the college campus includes electric kettle, one microwave (1000 watt) and one monthly LPG cylinder at canteen.4 solar streetlight,17 CFL,37 desktops,14 led bulb (5 hrs./day for 1 month) and AC,165 ceiling and 43 wall fan (small and big in size both),5 exhaust fan,2 refrigerator,9 printer,7 laptop,13 projector,8 router,12-piece speaker phone and 16 camera sets.

Per month energy consumption rate varies 12 kWh i.e., 50 watt of duration 8 hrs. 30 days. Overall, 14 electrical equipments are available in the lab section of the college campus. Two DG (diesel generator) with its chimney(stack) i.e., flow pipe and an earth pit are available for energy consumption.

The college adapted some energy conservation methods such as installation of solar streetlight to reduce impact of renewable energy on streetlight; single switch set up outside each classroom and LED lights.

Sewage

Domestic sewage management

Domestic sewage is generated through the use of water for sanitary(1000 liter/month) and canteen(20 kg/month)s purposes. The sewage generated after the use is connected to the municipal sewer lines through the underground tanks.

Solid waste

Solid waste management

Solid waste (less than 20 kg/year) major sources are from the canteen and stationary wastes. The food waste is treated through biodegradable compost fertilizer plant(pit) and then the manure is used for the plantation site. General solid waste (less than 10kg/day) or less than 1 kg/day i.e., stationary waste is thrown and dumped casually on the nearby nallah severely affecting the natural water body with foul smell and destroying beautification.

5.1.6.E-waste

E-waste management

Since the organization is well established and equipped with the necessary and up-to-date electronic infrastructure, the e-waste generation like scraped computer, laptop, xerox machine(less than 20 kg/year) is very minimal. However, as a proactive initiative, an authorized vendor is identified for disposal of e-waste in case it is generated. Usually the contracts for electronic items are done with the buyback assurance so as to meet the e-waste disposal requirements of the legislation. E-waste and hazardous waste specially from chemistry lab(less than 20 liter/month) after generation should be segregated from other sources and kept separately identified for disposal in systematic way through the authorized vendors.

Other Environmental Initiatives

a. Approximately a wholesome visitor visit the campus every year. Institute offer warm and green welcome to them and describes the green initiatives as a part of the induction to them on their visit. Institute has NSS group that mainly take part in "**Biodiversity and its Conservation**" program which is UGC recognized from last 5 years.

b. Related to environmental awareness
    - Seminar and conferences on Amazon fire
    - Exhibition
    - Training

- Field visit
- Introduction of plants with students
- Encourage students to save and plant trees by poster presentation and procession.
- Nature tours are also conducted for the students.
- Every year tree plantation program organized on Independence Day, on World Environment Day and on World Earth Day.
- Handwashing awareness programs are also organized.
- Awareness program on vector-borne diseases with local people
- Other activities like celebration of Aranya Saptaha, Gandhi global solar yatra and carbon footprint is done.

Environmental CSR activities are also conducted every year and specific activities for environmental protection up to the mark are also carried out each year differently. A Lecture series organize for the environmental awareness and related issues every year under organizing committee AND NSS team in P N Das college, Palta for stake holders to take benefits of it.

Conclusion

The institute strives hard and sincerely towards conservation of environment. The institute has put lot of efforts in the water and Energy management. It is noteworthy to say about the Compost Fertilizer Project, plastic, and smoke-free zone effective management of the environmental drives. It shows the commitment and responsibility towards the Mother Nature. There are always opportunities for improvements which are noted in the different sections for making the activities robust. The institute is also focused on conserving biodiversity, they made shelters for bird. These would help in the journey of sustainable development which already have been started and reached at a remarkable height.

Institute takes care of the students and staff well. The rooms are well ventilated and having sufficient light levels. There is not much noise that would disturb the education process as the college is surrounded by much considerable green belt

Recommendations

- As of now there is a count of the trees and medicinal plants also being planted. Localized species can be more used for plantation since they are more suitable to the local environment and habitat. It can become a habitat of the native birds, animals and insects and can help in biodiversity conservation and reclamation. A count of variety of species can also be kept handy. It can be treated as a structural biodiversity creation effort for achieving substantial positive results.
- Further to the provisions of water in the institution, methods can be applied to use much more of the rainwater harvesting water for sanitary purposes by advanced water treatments like installing active monitoring system, installation of push taps and atmospheric water generator. Specific efforts for conservation of fresh water through auto water taps based on occupancy sensing mechanism.
- Periodic energy audits can be planned to have enough data on savings and contribution through use of green energy. Occupancy sensors can be planned to avoid manual intervention in shutting off and starting on the lighting systems in various rooms. Rooftop solar plant is highly recommended for enough energy supply in the campus.
- Based on the population of each day and the daily water supply quantities, domestic sewage can be quantified for further water conservation purpose. Specific water audit can be conducted to know the water inflow and out flow along with the losses, leakages, wastages etc. to plan actions for water conservation
- Quantification of everyday canteen waste can be taken up and it can also be displayed in the canteen to refrain and educate the consumers about the wastages and losses to the environment and human efforts. For Sanitary waste, agreement to be done with Biomedical Waste Management recycling / disposal agencies. For solid waste agreement has to be done with local municipality.
- E-waste listing and quantification in detail can be useful further to reduce the e-waste generation.

ANNEXURE – 1

Green Audit Survey: Session 2018-2019

1. Survey form for Auditing Water Management

1.	List uses of water in your college.	Used for toilets, kitchen, Garden, labs, fishery
2.	What are the sources of water in your college?	Ground Water, Retaining water in ponds, rain water
3.	How many wells are there in your college?	1 tube well, 3 wells for Submersible pump
4.	No. of motors with HP, used for pumping water from each well?	Total 3 Power: 2hp, 1 hp, ½ hp
5.	What is the depth of each well?	Depth of boring: 300 ft, 300ft, 200 ft TUBE well 650 ft
6.	What is the present depth of water in each well?	300 ft, 300ft, 200 ft Well 650 ft
7.	How does your college store water?	over head tanks, Ponds
8.	Quantity of water stored in your overhead water tank? (in litres)	2000 L x 2, 1500 L x1, 1000 L x 4, 500 L x 1= Total: 10000 L
9.	Quantity of water pumped every day? (in liters)	Approx 2500 L
10.	If there is water wastage, specify why.	For the use in toilets and Labs and hand washing points
11.	Where does waste water come from?	Water from toilets and Labs and hand washing points
12.	Where does the waste water go?	Water from toilets

		goes to High drain. Water from Lab goes to underground
13.	What are the uses of waste water in your college?	Not used
14.	What happens to the water used in your labs? Is it mixing with groundwater?	Goes underground. Negligible amount is used only in General Chemistry Laboratory with low student strength
15.	Is there any treatment for the lab water?	No.
16.	Are your labs practicing green chemistry methods?	No
17.	Water charges paid to water connections if any	None
18.	No. of water coolers. Amount of water used per day? (in litres)	3, 250 L/Day
19.	No. of bath rooms in staff rooms, common, hostels.	1, Staff Quarter, 2in Ladies Hostel
20.	Amount of water used per day?	100 L (Bathroomsat Ladies hostel not used because there is no student at present)

21.	No. of toilet, urinals. Amount of water used per day?	13(Staff Room:1 NT Staff members:1 Principal Office:1 Library Building:2 Science Building:1 Students:4 Common Room:1 and Ladies' Hostel :2) 1200 L approx.
22.	No. of water taps in the canteen. Amount of water used per day?	5- Taps 100 Ltr. approx.
23.	Amount of water used per day for garden use.	Average: 100 L
24.	No. of water taps in laboratories. Amount of water used per day in each lab?	2 Less than 10 L
25.	At the end of the period, compile a table to show how many litres of water have been used in the college for each purpose	Given below
26.	Is there any water used for agricultural purposes?	No

27.	Does your college harvest rain water?	Yes
	If yes, how many rain water harvesting units are there? (Approx. amount)	No
28.	How many of the taps are leaky? Amount of water lost per day?	None (It is repaired immediately if found)

2. Survey form for Auditing Waste Management

1.	What is the total strength of students, teachers and Non- teaching staff in your College?	Total Students: 726 No. of Teachers:37 No. of Non Teaching Staff:15 Total : 778
2.	Which of the following are available in your College? Give area occupied and number	
	Garden area	900 sq.m.
	Garbage dump (number)	2
	Playground area	790 sq.m +1030 sq.m.
	Laboratory	260 sq.m
	Kitchen Canteen	400 sq.ft
	Toilets (number)	15
	Car/scooter shed area	65 sq.m
	Number of classrooms and office rooms	No of Class Room: 20 Office Room: 4
	Others (specify) car parking zone	approx 160 sq.m.

3.	Does your college generate any waste?	Yes
	If so, what are they? How much quantity? Number or weight	
	E-waste	Scraped computer, laptop, Xerox machine etc. Less than 20 kg/year
	Hazardous waste (toxic)	Form Chemistry Lab. Less that 20 litres/ month
	Solid waste	Electrical waste like Tube, bulb, battery etc less than 20kg/year
	Canteen waste	Less than 20 Kg/Month
	Liquid waste	From Toilets, Canteen, Labs, open hand washing points Less than 1000 lit/month
	Glass	Tea cups Negligible amount
	Unused equipment	Electric equipments,
	Medical waste if any	Medical Room Negligible

	Napkins	Negligible
	Others (Specify)	

4.	Is there any waste treatment system in the college?	No
5.	Is there any treatment for toilet/urinal/sanitary napkin waste?	No
6.	What is the approximate amount of waste generated per day? (in Kilograms) (approx.) Biodegradable non-biodegradable	Biodegradable: less than 10 kg/day Less than 1kg/day
7.	How is the waste generated in the college managed? Methods - Composting, Recycling ,	Stored in compost pit
	Reusing ,Others (specify)	No
8.	Do you use recycled paper in College?	No
9.	Can you achieve zero garbage in your college? (Reduce,Recycle, Reuse, Refuse) If yes, how?	Plastic Free Zone

3. Survey form for Auditing Green Campus Management

1.	Is there a garden in your college? Area?	Yes, 900 sq.m.
2.	Do students spend time in the garden?	Yes
3.	List the plants in the garden, with approx. numbers of each species.	Given in the below
4.	List the species planted by the students, with numbers.	List given
5.	Whether you have displayed scientific names of the trees in the campus?	Yes for some trees and plants
6.	Are there any plantations in your campus? If yes specify area and type of plantation.	No

7.	Is there any vegetable garden in your college? If yes how much area?	No
8.	Is there any medicinal garden in your college? If yes how much area?	Yes,
9.	How much water is used in the vegetable garden and other gardens? Mention the source and quantity of water used.	Source: Ground water, ponds
10.	Who is in charge of gardens in your college?	Prof. AMAL KUMAR BHAKAT
11.	Whether you are using any type of recycled water in your garden?	No
12.	List the name and quantity of pesticides and fertilizers used in your gardens?	No fertilizer used except the manure form the
		compost pit
13.	Do you have any composting pit in your college? If yes What are you doing with the compost generated?	Yes Used as manure for the plants
14.	What are you doing with the vegetables harvested? Do you have any student market?	Na
15.	Is there any botanical garden in your campus? If yes give the details of campus flora.	No
16.	Name number and names of the medicinal plants in your college campus.	List given below

17.	Any threatened plant species planted/conserved.	No such
18.	Is there a nature club in your college? If yes what are their activities?	Yes, 1.To introduce the students with the plants. 2. To encourage students to save and plant trees. 3. Nature Tours are conducted for the students.
19.	Is there any arboretum in your college? If yes details of the trees planted.	No
20.	Are there any fruit yielding plants in your college? If yes details of the trees planted.	Yes, Coconut, Kul, Mango etc
21.	Are there any groves in your college? If yes details of the trees planted.	No
22.	Is there any irrigation system in your college?	No
23.	What is the type of vegetation in the surrounding area of the college?	The college is surrounded by big old trees
24.	Share your IDEAS for further improvement of green cover.	i) To increase the medicinal garden ii) Increasing fruit plants

4. Survey form for Auditing Carbon Footprint

1.	What is the total strength of students and teachers in your College?	
	No. of Students	726
	No. of Teachers	37
	No. of Non teaching staff	15
	Total	778
2.	Total Number of vehicles used by the stakeholders of the college.(per day)	Cycle: 280 Two wheelers: 10 Car: 6
3.	No. of cycles used	nearly 300
4.	No. of two wheelers used (average distance travelled and quantity of fuel and amount used per day)	Average 10 (100 Km)
5.	No. of cars used (average distance travelled and quantity of fuel and amount used per day)	Average 6 (300 Km, 20 Litres)
6.	No. persons using common (public) transportation (average distance travelled and quantity of fuel and amount used per day)	Average 300 (Not measured)
7.	No. of persons using college conveyance by the students, nonteaching staff and teachers (average distance travelled and quantity of fuel and amount used per day)	None
8.	Number of parent-teacher meetings in an year? Parent turn out (approx.)	2-3 (Approx 100)
9.	Number of visitors with vehicles per day?	Less than 10

10.	Number of generators used every day (hours). Give the amount of fuel used per day.	1 Used only at the time of load shedding (Average 1 litre/day)
11.	Number of LPG cylinders used in the canteen (Give the	1 (Less that 1 litre/Day)

	amount of fuel used per day and amount spent).	
12.	Average amount of taxi/auto charges paid per month by the stakeholders of the college.	Not calculated
13.	Use of any other fossil fuels in the college (Give the amount of fuel used per day and amount spent).	No
14.	Suggest the methods to reduce the amount of use of fuel by the stakeholders/students/teachers/non teaching s	Personal cars are shared among the staff members

Auditing for Green campus management

1. Is there a garden in your college? Area? **YES, 900 sq metre**

2. Is there concept based garden (star plants, medicinal plants, endemic species, agriculture, etc.), specify area for each. **MEDICINAL PLANTS**

3. Do students spend time in the garden? If so, approximate time and purpose. (Lists with priority Annexure-I). **NOT ALLOWED**

4. List the plants (scientific names, Family, etc.) in the garden, with approx. numbers of each species (Annexure-II).

SL NO	NAME OF PLANTS
1	KADAM (NEOLAMARCKIA CADAMBA)
2	QUEEN CREPE MYRTLE (LAGERSTROEMIA SPECIOSA)
3	NEEM (AZADIRACHTA INDICA)
4	**ROYAL POINCIANA** (DELONIX REGIA)
5	**YELLOW POINCIANA** (PELTOPHORUM PTEROCARPUM)
6	JACKFRUIT (ARTOCARPUS HETEROPHYLLUS)
7	COCONUT(COCOS NUCIFERA)
8	MANGO (MANGIFERA INDICA)
9	BLACKBERRY (SYZYGIUM CUMINI)

10	DATE (PHOENIX DACTYLIFERA)
11	HOG PLUMS (PHOENIX DACTYLIFERA)
12	SIRIS TREE (SAMANEA SAMAN)
13	MAHOGANI (SWIETENIA MAHAGONI)
14	LIMONIA (RAVENIA SPECTABILIS)
15	GUAVA (PSIDIUM GUAJAVA)
16	**INDIAN GOOSE-BERRY** (PHYLLANTHUS EMBLICA)
17	TEAK (TECTONA GRANDIS)
18	MANILA TAMARIND (ARTABOTRYS HEXAPETALUS)
19	MICKEY MOUSE PLANT (MICHELIA CHAMPACA)
20	WHITE CHAMPA (MICHELIA CHAMPA)
21	KARANDA (CARISSA CARANDAS)
22	GULGUL (COMMIPHORA MUKUL)
23	MOSANDA (TROTHIC SAGERETIA)
24	FARKERIA (CRASSULA OVATA)
25	KUL (ZIZIPHUS ZIZYPHUS)
26	WHITE OLEANDER (NERIUM OLEANDER)
27	CASUARINA (THUJA OCCIDENTALIS)
28	GOLDEN DURANTA (DURANTA

	ERECTA)
29	JUNGLE GERANIUM (IXORA COCCINEA)
30	CURRY LEAF (MURRAYA KOENIGII)
31	EAR-LEAF ACACIA (ACACIA AURICULIFORMIS)

5. List of campus flora (attach a list of plants with details, including scientific name, family, approximate number of plants, etc.) in your campus. **Not Counted**

6. Name and number of the medicinal plants in your college campus.

SL NO	NAME OF THE PLANT
1	ALOE VERA (BITTER)
2	ALOE VERA (SWEET)
3	WHITE MALABAR NUT
4	RED MALABAR NUT
5	BLACK TURMERIC
6	ARROWROOT
7	CURDIMUM
8	LEMONGRASS
9	BILANGULI
10	EKANGI (RHIZOMA KAEMPFERIAE)
11	WHITE BASIL

12	LEMON BASIL
13	CLOVE BASIL
14	RED BASIL
15	BLACK BASIL
16	MINT
17	BRIGHT EYES
18	INDIAN SARSAPARILLA.
19	GREEN CHIRETTA
20	TOUCH ME NOT
21	BUTTERMILK ROOT
22	KAKAMACHI
23	AYAPANA

7. Any threatened plant species planted/conserved (provide a list with their threat status).
NO SUCH FOUND

8. List the plants to be planted on your campus in the next three years.
(Trees, vegetables, herbs, etc.) TREES AND HERBS

9. List the species planted by the students, with numbers (Annexure –III).

SL NO	NAME OF PLANTS
1	QUEEN CREPE MYRTLE (LAGERSTROEMIA SPECIOSA)
2	NEEM (AZADIRACHTA INDICA)
3	MANGO (MANGIFERA INDICA)
4	BLACKBERRY (SYZYGIUM CUMINI)
5	SIRIS TREE (SAMANEA SAMAN)
6	GUAVA (PSIDIUM GUAJAVA)
7	WHITE CHAMPA (MICHELIA CHAMPA)
8	GULGUL (COMMIPHORA MUKUL)
9	KUL (ZIZIPHUS ZIZYPHUS)
10	CASUARINA (THUJA OCCIDENTALIS)
11	GOLDEN DURANTA (DURANTA ERECTA)
12	JUNGLE GERANIUM (IXORA COCCINEA)
13	CURRY LEAF (MURRAYA KOENIGII)

10. Have you got any external funding for developing gardens in the campus? If yes, year, agency, and amount of funding. **NO**

11. Explain how you utilized funds for gardens. **FUNDS FROM COLLEGE ARE USED FOR PLANTATION, CLEANING, BEAUTIFICATION ETC**

12. Whether you have displayed scientific names of the plants in the Campus? **YES, FOR MEDICINAL PLANTS**

13. What are the vegetables cultivated in your vegetable garden? (Mention the quantity of harvest in each season). **NO**

14. How much water is used in the vegetable garden and other gardens? **NA**

15. Mention the source and quantity of water used (per month). **PONDS AND GROUND WATER**

16. Are you using any type of recycled water in your garden? **NO**

17. Who is in charge of gardens in your college? **Prof. AMAL KUMAR BHAKAT**

18. Is there any permanent staff to look after gardens in the campus? **YES, THERE IS GREENERY COMMITTEE CONSISTING OF PERMANENT STAFFS**

19. List the name and quantity of pesticides and fertilizers used in your gardens? **MANURE FROM COMPOST PIT**

20. Are you doing any organic practice in your campus? List them? **NO**

21. Do you have any composting pit (specify what compost) in your college? If yes, what you do with the compost generated? **YES. PIT FOR BIODEGRADABLE WASTE. MANURE IS USED FOR GARDENING**

22. Do you have a vegetable garden on the campus? **NO**

23. If yes, how the harvested vegetables are utilized? Do you have any market in the campus? **NA**

24. Is there a nature club in your college? If yes what are the activities? **Yes,**
1.TO INTRODUCE THE STUDENTS WITH THE PLANTS.

2. TO ENCOURAGE STUDENTS TO SAVE AND PLANT TREES.

3. NATURE TOURS ARE CONDUCTED FOR THE STUDENTS.

25. Is there any arboretum in your college? If yes details of the trees planted. **NO**

26. Is there any fruit yielding plants in your college? If yes details of the trees planted.
YES; COCONUT, MANGO, KUL, KOROMCHA ET

27. Is there any groves in your college? If yes details of the trees planted. **NO**

28. Is there any irrigation system in your college? **NO**

29. What is the type of vegetation in the surrounding area of the college? **SURROUNDED BY OLD TREES AND FORMS A LUSH GREEN ATMOSPHERE.**

30. What are the nature awareness programs conducted in the campus? (2014-19). Provide a list (annexure-IV)
EVERY YEAR WE CELEBRATE

a) **TREE PLANTATION PROGRAMME ON 15TH AUGUST**
b) **WORLD ENVIRONMENT DAY**
c) **WORLD EARTH DAY**
d) **AWARENESS ON VECTOR BORNE DISEASES AMONG STUDENTS AND IN THE ADOPTED VILLAGE ALONG WITH LOCAL PEOPLE**
e) **HAND WASHING AWARENESS**

SOME OTHER ACTIVITIES: A) CELEBRATE ARNYA SAPTAHA,

B) SEMINAR ON AMAZON FIRE,

C) ORGANISED GANDHI GLOBAL SOLAR YATRA

D) CARBON FOOTPRINT IS DONE

31. What are the involvement of students in the green cover maintenance? Planting saplings and maintenance
STUDENTS MAINLY FROM NSS TAKE PARTS IN PLANTATION IN DIFFERENT OCCASIONS. WATERS NEWLY PLANTED SAPLINGS

32. What is the total area of the campus under tree cover? Or under tree canopy?
APPROX. 3000 SQ.M

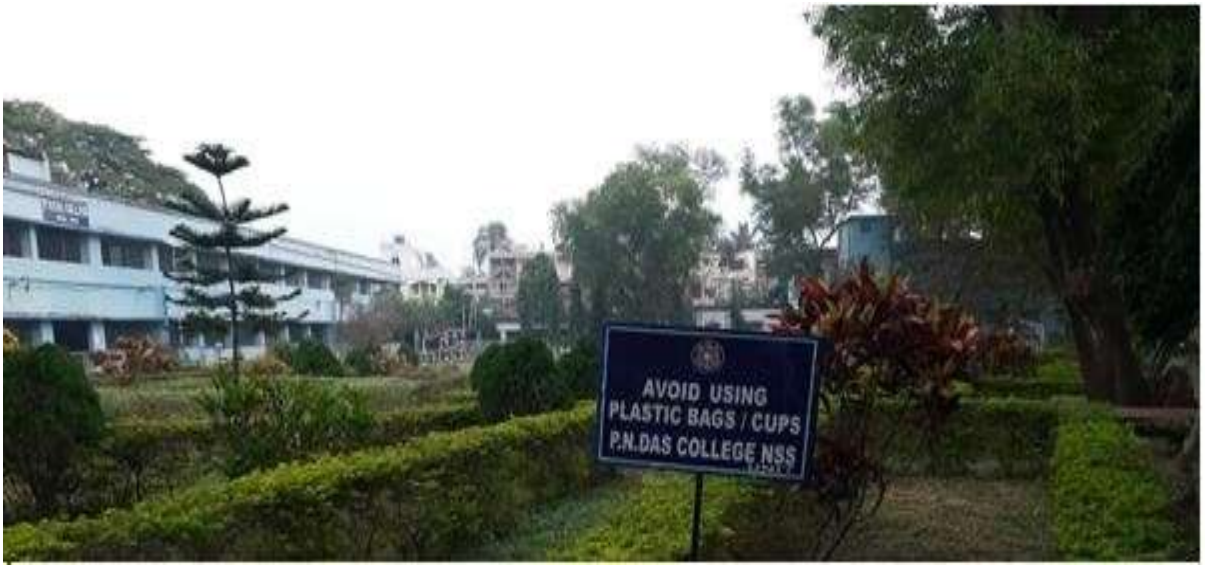
33. Share your future plans for further improvement of green cover.
EXCEPT THE PLAYGROUND AND BUILT UP AREA MOST PART IS GREEN.

IN FUTURE WE WILL PLANT SOME FRUIT TREES

34. Have you incorporated green conservation aspects in your curriculum?
NO. CURRICULUM IS INDUCED BY OUR ALMA MATER UNIVERSITY

35. How often you conduct public programs on green conservation?
YEARLY 5 PROGRAMMES

36. Do students reach out to the public in conveying the message of nature conservation?
YES. IT IS DONE BY OUR NSS STUDENTS THROUGH POSTERING, PROCESSION ETC.



Questionnaire for Water Management Auditing

1. What is the total Area of the campus? **4.285 acres/17340.75 Sq.Mt**.
2. Number of total teachers, non- teaching staff and students in the campus. **37+15+726=778**
3. Provide a list with different uses of water in the campus (Annexure 2-I).

   USED FOR TOILETS, KITCHEN, GARDEN, LABS, FISHERY
4. Name different sources of water in your college?

   GROUND WATER, RETAINING WATER IN PONDS, RAIN WATER
5. How many wells are there in your college?

   1 TUBE WELL, SUBMERSIBLE BORING, EXCESS WATER GOES TO UNDERGROUND THROUGH 1 WELL
6. Number of electric motors used for pumping water from each well? **3**
7. What is the total horse power of each motor? **Power: 2HP, 1 HP, ½ HP**
8. What is the depth of each well? **600 FT (TUBE WELL) 300 FT, 300FT, 200FT**
9. What is the present depth of water in each well?**600 FT (TUBE WELL) 300 FT, 300FT, 200FT**
10. How does your college store water?

    OVER HEAD TANKS, PONDS
11. Capacity of the overhead water tank/s in the campus? (in litres)

    2000 L x 2, 1500 L x1, 1000 L x 4, 500 L x 1= Total: 10000 L
12. Quantity of water pumped every day? (in litres) **2500 L**
13. How do you justify that the water usage is judicious in the campus?
    a) **Amount of water used per day is low.**
    b) **Poster for preventing the abuse of water has been there.**
    c) **Awareness programmes are organised for the students.**
14. Is there any water wastage? If yes, specify why and how.

    NOT IN GENERAL. IT MAY HAPPEN BY MISTAKES OR SUDDEN LEAKAGE
15. Is there any mechanism to identify water wastage in the campus, explain (Annexure 2-II).

    COMMITTEE CONSISTING OF FULL TIME STAFF IS THERE FOR MONITORING.

16. What are the possible ways to check wastage of water? **CONTINUOUS INSPECTION.**

17. Is there any waste water generation happening in the campus?

FOR UNAVOIDABLE SITUATIONS

18. What are the possible sources of waste water in the campus?

AT TOILETS AND HAND WASHING POINTS

19. Where does the waste water go? **CANAL THROUGH DRAIN**

20. Are you reusing the waste water after recycling it? **NO**

21. What are the systems of management of water used in your labs, especially Chemistry lab (or labs where experiments are happening involving chemicals)?

AMOUNT OF WATER USED IS NEGLIGIBLE ONLY AT CHEMISTRY LAB WITH A VERY LOW STUDENT STRENGTH

22. Does this water get mixed with ground water? **YES**

23. Is there any treatment for the lab water after usage? **NO**

24. Is there a system of practice of green chemistry in your campus? Give details. **NO**

25. Write down four ways that could reduce the amount of water used in your college.

a) **RECYCLING OF WATER**
b) **MORE USE OF POND WATER**
c) **INSTALLATION OF ATMOSPHERIC WATER GENERATOR**

26. Record of water use from the college water meter for six months.

There is no water meter

27. Amount, if any, as charges towards water paid for water connections. **None**

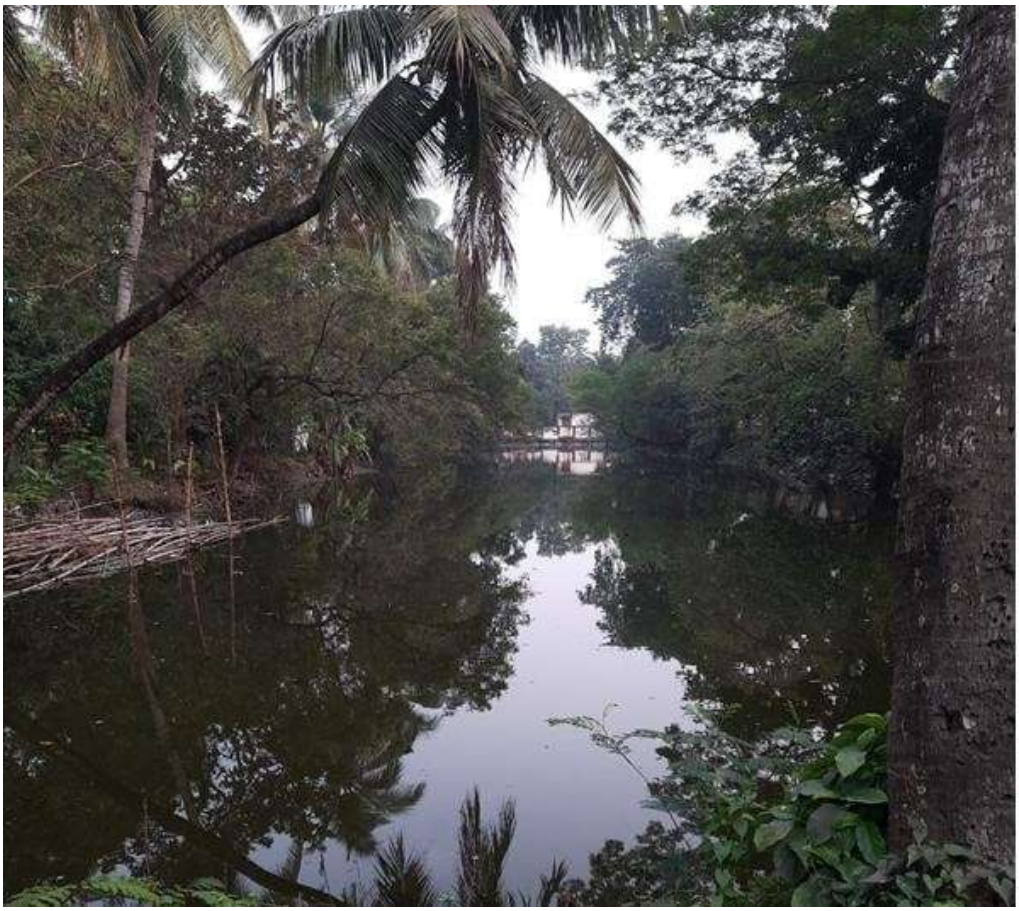
28. Number of water coolers in the campus. Amount of water used per day? (in litres)

3, 250 L

29. Number of water purifiers in the campus, if any. **6**

30. Number of water taps in the campus. Amount of water used per day? **Nearly 30, Approx.600 L**

Water Body



31. Number of bath rooms and toilets separately for staff rooms, common, hostels (Annexure 2- III)

No. of Bathrooms: 1 (Staff Quarter)

2 (Ladies Hostel)

No. of Toilets:

(Staff Room:1

NT Staff members:1

Principal Office:1

Library Building:2

Science Building:1

Students:4

Common Room:1 and

Ladies' Hostel :2)

32. Number of toilets?**13**

33. Amount of water used per day in the toilets? **Nearly 1200 Litres**

34. Number of water taps in the canteen. Amount of water used per day? **5, Less than 100 L/Day**

35. Amount of fire-wood used in the canteen kitchens? **None**

36. How much ash collected after burning fire wood per day in the canteen? **None**

37. Amount of water used per day for irrigation purpose. **Not used**

38. Number of water taps in laboratories. Amount of water used per day in each lab? **2, Less than 10 litres**

39. Number of taps in hostels. **6**

40. Total use of water in each hostel? **Not used because there is no student at present**

41. Provide a list of month wise water usage in different areas in the campus:

Sl. No.	Area of the Campus	Water used per month
1	Water taps	14400 L

2	Toilets	28800 L
3	Water Purifier	6000 L
4.	Cooler	6000 L
5	Bathrooms	3000 L
6	Garden	2400 L

42. Is there any water used for agricultural purposes? **No**

43. Is there any rain water harvest system in the campus? If yes, details of the storage capacity? **Yes, (1000 L per day)**

44. Report on the status of their functioning. **Water collected is refined and used for toilets and excess water is sent the underground through filter.**

45. Provide number of damaged taps in the campus? **Amount of water lost due to damaged** taps or water supply system per day?. **None, it is repaired immediately if found damaged**

46. How do you convey the message of water conservation in the campus? **Through postering and verbal awareness**

47. How many water fountains are there? **None**

48. How often is the garden irrigated? **2-3 times a week**

49. Amount of water used to water the ground? **Average 100 L/Day**

50. Amount of water used for college bus cleaning? (litres per day) **NA**

51. Is there any other way by which water is being utilized?.**No**

52. Area of the college land which is under concrete tiles. **Approx. 3700 sq. mt**

53. Is there any future plan for the water management in the campus?

a) **To install an atmospheric water generator**

b) **To increase water holding capacity of the ponds by dredging**

54. Are there any water saving techniques followed in your college? Explain?

a) **Continuous awareness among the stakeholders**
b) **Active Monitoring System**
c) **Push taps have been installed**

55. Is there any mechanism by which the message on water conservation is being conveyed to staff and students? **Through poster and verbal awareness**

Questionnaire for Energy Management Audit

1. List out ways of energy usage in the campus. (Electricity electric stove, kettle, microwave, incinerator; LPG, firewood, Petrol, diesel and others). **Electric kettle, Microwave at Canteen, Diesel**
2. Electricity bill amount for the last three years.
   2016-2017: Rs. 213197

   2017-2018: Rs: 215622

   2018-2019: Rs: 200263
3. Amount paid for LPG cylinders for the last three years. **College does not buy any LPG Cylinders. Canteen personnel arrange it. Monthly One cylinder is used on an average.**
4. Any other payments towards energy related matters for the last three years in the campus:

Environment Related Expenditure						
Session	Gardening including Gardener's Salary	Ground Dev/ Cleaning Ch.	NSS Activities (Regular)	Electricity EXP.	Others	**Total**
18-19	69197	41000	18359	200263	9000	**337819**
17-18	110681	Year	26694	215622		**352997**
16-17	64513	45000	33979	213197	24500	**381189**

5. Weight of firewood used per month and the amount of money spent? Also mention the amount spent for petrol/diesel/others, if any?

Expenses for Diesel: The amount is included in Electricity Expenses

Year	**17-18**	**18-19**
Expenses on Diesel	**16766**	**18504**

6. Are there any energy saving methods employed in your college? If yes, please specify.
Yes, a) Solar lights have been installed

b) A common on/off switch has been fixed outside each class room

c) LED bulbs are used

d) AC's are operated according to need basis and time basis.

7. What are the types of bulbs used in campus?

Ans:- CFL and **LED, Incandescent.**

8. Provide a list of number of bulbs each type.

Ans:-

1. LED bulb	**14 pcs**
2. Incandescent bulb	**2 pcs**
3. LED Tube	**256 pcs**

9. Provide the total energy utilization by each types of bulb per month

Ans:-

1. LED bulb (5hrs/day for 26 days)	**20.1kwh/month**
2. Incandescent bulb(5hrs/day for 26 days)	**20kwh/month**
3. LED tube (6hrs/day for 26 days)	**798.72kwh/month**

10. How many CFL bulbs has your college installed? Mention use (Hours used/day for how many days in a month)

Ans:- **Street light- 17 pieces. (8hrs/day for 30 days.)**

11. Energy used by each bulb per month?

Ans:- **50 Watt *8hrs *30days= 12 kwh/month per bulb.**

12. How many LED bulbs has your college installed? Mention use (Hours used/day for how many days in a month)

Ans:- **14 LED. (5hrs/day for 30 days)**

13. How many Incandescent (tungsten) bulbs has your college installed? Mention use (Hours used/day for how many days in a month)

Ans:- **2 Incandescent (5hrs/day for 25 days)**

14. How many fans installed in the campus? Mention use

(Hours used/day for how many days in a month)

Ans:-

Ceiling fan	**165 pcs**
Wall fan (big)	**2 pcs**
Wall fan (small)	**41 pcs**
Exhaust fan	**5 pcs**

(6hrs/day for 26 days)

15. Energy used by all fans per month?(kwh)

Ceiling Fan(165pcs-80watt each)	**2059kwh/month**
Wall fan(big) (2pcs-1000watt each)	**312kwh/month**
Wall fan (small) (41pcs-50 watt each)	**319.8kwh/month**
Exhaust fan (5pcs-40watt each)	**31.2kwh/month**
Total	**2722kwh/month**

16. How many air conditioners are in use in the campus? Mention time of their usage (Hours used/day for how many days in a month)

Principal's Room	**2pcs(maximum 5hrs on weekdays)**
Office room	**2 pcs (maximum 4hrs on weekdays)**
Teachers room	**2 Pcs(maximum 4hrs on weekdays)**
IQAC room	**2pcs(Only at the time of meeting)(assuming 2hrs for 2days in one month)**
Auditorium	**4 pcs (Occasionally for conducting any programme)(assume 4hrs and 2 days in a month)**

17. Energy used by all air conditioners per month?(kwh)

Principal's Room	**546kwh/month**
Office room	**436.8kwh/month**
Teachers room	**436.8kwh/month**
IQAC room	**16.8kwh/month**
Auditorium	**33.6kwh/month**

18. How many electrical equipments including weighing balance used in the campus?

Mention time of their usage (Hours used/day for how many days in a month)

Fridge	**2pcs**
Aquaguard	**5pcs**
Motor	**3pcs(1HP,2HP,0.5HP)**
Printer	**9pcs**
Laptop	**7pcs**
Projector	**13pcs**
Router	**8pcs**
Speaker	**12pcs**
Camera	**16pcs**

19. Energy used by such electrical equipment per month?(kwh)

Ans:-

Fridge	**260kwh/month**
Aqua guard	**27kwh/month**
Motor	**1hp= 6.5kwh/month, 2hp= 13kwh/month, 0.5hp=3.25kwh/month**
Printer	**46.8kwh/month**
Laptop	**36.4kwh/month**
Projector	**8.4kwh/month**
Router	**6.24kwh/month**
Speaker	**5.2kwh/month**
Camera	**49.9kwh/month**

20. How many computers were in use in the campus? Mention time of their usage

(Hours used/day for how many days in a month)

Ans:- **37pcs Desktop. (4hrs/day for 26days)**

21. Energy used by all computers per month?(kwh)

Ans:- **769.6kwh/month.**

22. How many photocopier machines are installed and in use at present in the campus?

Mention time of their usage (Hours used/day for how many days in a month)

Ans:- **2pcs and all are in use. (4hrs/day for 20 days)**

23. Energy used by all photocopier per month?(kwh) Mention time of their usage (Hours used/day for how many days in a month)

Ans:- **148.8kwh/month (4hrs/day for 20 days)**

24. How many cooling apparatus are present in the campus? Mention time of their usage (Hours used/day for how many days in a month)

Ans:- **3 water chiller (4hrs/day for 26 days in Summer)**

25. Energy used by all cooling apparatus per month? (kwh) Mention time of their usage (Hours used/day for how many days in a month)

Ans:- **93.6 kwh/month (4hrs/day for 26 days)**

26. How many inverters did your college install? Mention time of their usage (Hours used/day for how many days in a month)

Ans:- **None**

27. Energy used by each inverter per month?(kwh)

Ans:- **N.A.**

28. How many electrical equipment are installed in different labs (methods that are not

included in the above calculations) in the campus? Mention time of their usage (Hours used/day for how many days in a month)

Ans:-

Chemistry lab	**2**
Physics lab	**12**

29. How many electrical equipments are available in all labs in the campus?

Ans:- **14**

30. Energy used by all equipments together per month?(kwh)

Ans:- **Negligible amount for LAB due to low student strength (Less than 1KW per month)**

31. How many heaters used in the canteen of your college? Mention time of their usage (Hours used/day for how many days in a month)

Ans:- **1 Micro oven(1000 watt)**

32. Energy used by each heater per month?(kwh)

Ans:- **15kwh/month.**

33. No. of Street lights in your college?

Ans:- **17 CFL**

34. Energy used by all street lights per month? (kwh)

Ans:- **CFL= 204kwh, Solar=48kwh**

35. No. of televisions in your college and hostels?

Ans:- **3 Televisions.**

36. Energy used by all TV's per month? (kwh)

Ans:- **None. (TVs are not used)**

37. Any other items that uses energy(Please write the energy used per month) Mention time of their usage (Hours used/day for how many days in a month)

Ans:-

Items	**No and wattage**	**Kwh/month**
LED metal	**2pcs-50 watt(assume 1hr/day for 1 day)**	**0.1kwh**
LED Panel Light	**24pcs-9 Watt(assume 4hr/day for 2day)**	**1.728kwh**
Led panel light	**10pcs-15 watt(assume 4hr/day for 2 day)**	**1.2kwh**

38. Does the campus have any alternative energy sources/nonconventional energy sources?(photovoltaic cells for solar energy, windmill, energy efficient stoves etc.) Specify.

Ans:- **No**

39. Do you run "Switch Off" drills at college?

Ans:- **No**

40. Are your computer and other equipment put on power-saving mode?

Ans:- **Yes when it remains idle.**

41. Does your machinery (TV, AC,Computer,Weighing balance, printers etc.) runs on stand by modes of the time? If yes how many hours?

Ans:- **TV is not used, AC's are run for maximum 5 hours, Printers are used maximum 2 hours**

36. What are the energy conservation methods adapted by your college?

Ans:- **(i) Solar lights have been installed**

(ii) a single switch has been set up outside each class room.

(iii) LED lights have been installed in the campus

(iv) AC, Coolers etc are used as per restricted duration.

37.Is there any public awareness systems informing the necessity of energy conservation in the campus?

Ans:- **Postering in different places, Awareness among the students at the time of orientation.**

38. Write a note on the Methods/practices/adaptations by which you can reduce the energy use in your college campus in future.

Ans:- **Our main aim in this regard is to install a rooftop solar plant for sufficient energy supply.**

Questionnaire for Carbon footprint Auditing

1. Total number of students and teachers in your College?

Gender	No of students	No of Teachers	No of non-teaching staff
Male	**357**	**21**	**13**
Female	**369**	**16**	**2**
Transgender	**0**	**0**	**0**
Total	**726**	**37**	**15**

2. Total Number of vehicles used by the stakeholders of the college/per day.

(Cycles 300+ 10 bikes + 6 cars)

3. No. of cycles used/day in the campus. **300 approx**

4. No. of two wheelers used (average distance travelled, cc of two wheelers and quantity of fuel and amount used/day). (C.F-Annexure-I).

No. of two wheelers used: 10

average distance travelled: 100 km

cc of two wheelers 150 CC X 10=1500 CC Approx.,

quantity of fuel 2 Ltr. Approx.

amount used/day Rs. 180/ Approx

5. No. of cars used (average distance travelled, power of engine (cc) and quantity of fuel and amount used/day). (C.F-Annexure-II).

No. cars: 06

CC of cars: 1000 cc/1200cc

Fuel used: 20 Liters

Amount: Rs. 1600/ approx

6. No. persons using common (public) transportation (average distance travelled and quantity of fuel and amount used/day). **Not Calculated**

7. No. of persons using college conveyance (general transportation) by the students, non-teaching staff and teachers (average distance travelled and quantity of fuel and amount used per day): **Nil**

8. Number of parent-teacher meetings in a year? Parents turned up (approx.)

Average 2 meetings:

Parents turned up: 300 for each meeting

9. Mention their mode of travel and give approximate cost of their commutation.

Public Transportations /Motor Cycles /Cars.
Cost not calculated

10. Number of visitors with vehicles per day? **10 Nos. Approx.**

11. Number of generators used/day (hours). Provide quantity and amount for fuel usage/day.

1 Used only at the time of load shedding

Average 1 litre/day

Rs.70

12. Number of LPG cylinders used in the campus. Provide quantity and amount of fuel used /day.

1 (Less than 1 litre)

13.Quantity of kerosene used in the canteen/labs (Provide quantity and amount of fuel used per day and amount spent). **Not Used**

14.Amount of taxi/auto charges paid and the amount of fuel used per month for the transportation of vegetables and other materials to the campus.

N/A (Goods Supplied by dealers)

15.Amount of taxi/auto charges paid per month for the transportation of office goods to the college. **N/A (GoodsSupplied by dealers)**

16.Amount of taxi/auto charges paid per month by the stakeholders of the college.

Rs.2450/- Approx.

17.Use of any other fossil fuels in the college (Give the amount of fuel used per day and amount spent). (C.F-Annexure-III). **Not Applicable**

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(TANMOY RUDRA)
Signature of the Auditor
(Scientist, Scientific and Environmental Research Institute)