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**Prepared By**

**IQAC, Paradip College, Paradip**



**GREEN AUDIT REPORT**

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**Executive summary**

Eco campus is a concept implemented in many educational institutions, all over the world to make them sustainable because of their mass resource utilization and waste discharge in to the environment. Waste minimization plans for the educational institute are now mandatory to maintain the cleanliness of the campus. To find out the environmental performance of the educational institutions and to analyze the possible solutions for converting the educational campus as eco-campus, the conduct of Green Audit of institution is essential. The green audit of “**Paradip College**”, **Paradip**, enables to assess the life style, action and its impact on the environment. This is the first attempt to conduct green audit of this college campus. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil and water, vegetation, waste management practices and carbon foot print of the campus etc. Initially a questionnaire survey was conducted to know about the existing resources of the campus and resource consumption pattern of the students and staff in the college. In order to assess the quality of water and soil, water and soil samples were collected from different locations of the college campus and analysed for its parameters. Collected data was grouped, tabulated and analyzed. Finally, a report pertaining environmental management plan with strength, weakness and suggestion on the environmental issue of campus are documented.

# INTRODUCTION

## About college

Paradip College, Paradip, Jagatsinghpur is one of the premier institutions of higher learning. Established in 1975, the college has been catering to the needs of Higher Education of the offspring of Paradip as well as its neighboring districts. It aims at fostering healthy moral, human, social values and ethical uprightness in the ambitious young students and prepares them to meet the challenges of globalization. At present the college offers teaching programmes in +2 Arts, Science and Commerce & +3 Arts, Science & Commerce with Honours facilities in History, Political Science, Economics, English, Odia, Philosophy, Education, Sociology, Physics, Chemistry, Mathematics, Botany, Zoology and Commerce. The vision of the college is to create ample opportunities of higher learning and research for the students of all sections of society and to provide value based education for producing generations of technically sound, efficient and responsible citizens and to cultivate in them a sense of universal brotherhood and fraternity and to motivate them towards a robust enterprise and adventure so as to successfully overcome the uncertain challenges of future. The fundamental aim of the college is to impart sound learning to young women under circumstances congenial to their all-round development. It encourages the students to aim at excellence not only in academic pursuits, but also in every aspect of human endeavour to achieve perfection.

The students are prompted to strive for academic excellence so that in course of time they may take up suitable careers for the betterment of their lives and also of their families and society at large. The various co-curricular activities of the college especially the extension programmes provide them with a rare social consciousness that motivates them to reach out to their fellowmen particularly the needy and the marginalised.

**Courses offered by the College**

|  |  |  |  |
| --- | --- | --- | --- |
| Aided Courses | B.A English | B.A Economics | B.A History |
| B.A Political Science | B.A Odia | B.A Philosophy |
| B.A Education | B.A Sociology |  |
| B.Sc. Physics | B.Sc. Chemistry | B.Sc. Mathematics |
| B.Sc. Botany | B.Sc. Zoology |  |
| B.Com |  |  |

## The student and faculty strength of the college is listed below:

|  |  |
| --- | --- |
| No of students | 1005 |
| No of teachers | 35+4(GF) |
| No of Non-teaching staffs | 24 |
| Gents | 442 |
| Ladies | 650 |
| Total | 1092 |

**Physical Structure**

The college is located in about 5 acres of land. The built-up area of the college is 2.5 acres.

|  |  |
| --- | --- |
| Departments | 14 |
| Laboratories | 06 |
| Conference halls | 01 |
| Libraries | 01 |
| Auditorium | 00 |
| Canteens | 01 |

**OBJECTIVES OF GREEN AUDIT**

The Chief aim and objective of this green audit is to assess the environmental quality and the management strategies being implemented at Paradip College, Paradip. The specific objectives are:

1. To assess the quality of the water and soil in the Paradip College campus
2. To monitor the energy consumption pattern of the college
3. To quantify the liquid and solid waste generation and management plans in the campus.
4. To assess the carbon foot print of the college
5. To assess whether the measures implemented by Paradip College have helped to reduce the Carbon Footprint.
6. To impart environment management plans to the college.
7. Provide a database for corrective actions and future plans.
8. To assess whether extracurricular activities of the Institution support the collection, recovery, reuse and recycling of solid wastes.
9. To identify the gap areas and suggest recommendations to improve the Green Campus status of Paradip College.

# TARGET AREAS OF GREEN AUDIT

Green audit forms part of a resource management process. Although they are individual events, the real value of green audit is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Eco-campus concept mainly focuses on the efficient use of energy and water; minimize waste generation or pollution and also economic efficiency.

All these indicators are assessed in the process of “Green Audit of this educational institute‟. Eco-campus focuses on the reduction of contribution to emissions, procures a cost effective and secure supply of energy, encourages and enhances energy use conservation, promotes personal action, reduce the institute’s energy and water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.

# Audit for Water Management

Water is a natural resource; all living organisms depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. Groundwater depletion and water contamination are taking place at an alarming rate. Hence it is essential to examine the quality and usage of water in the college. Water audit is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

# Auditing for Energy Management

Energy conservation is an important aspect of campus sustainability which is also linked with carbon foot print of the campus. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

# Auditing for Waste Management

Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health. Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. Solid waste can be divided into three categories: bio-degradable, non-biodegradable and hazardous waste. A bio-degradable waste includes food wastes, canteen waste, wastes from toilets etc. Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles etc. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals, acids and petrol. Unscientific management of these wastes such as dumping in pits or burning them may cause harmful discharge of contaminants into soil and water supplies, and produce greenhouse gases contributing to global climate change respectively. Special attention should be given to the handling and management of hazardous waste generated in the college. Bio-degradable waste can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-biodegradable waste can be utilized through recycling and reuse. Thus the minimization of solid waste is essential to a sustainable college. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems.

# Auditing for Green Campus Management

Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen released by the trees of the campus is good for the people in the campus. So while you are busy studying and working on earning those good grades, all the trees in campus are also working hard to make the air cleaner for you.

# Auditing for Carbon Footprint

Burning of fossil fuels (such as petrol) has an impact on the environment through the emission of greenhouse gases into the atmosphere. The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth’s atmosphere. The release of carbon dioxide gas into the Earth’s atmosphere through human activities is commonly known as carbon emissions. Vehicular emission is the main source of carbon emission in the campus, hence to assess the method of transporation that is practiced in the college is important.

**METHODOLOGY ADOPTED**

The methodology adopted to conduct the Green Audit of the Institution had the following components

# Onsite Visit

Four day field visit was conducted by the Green Audit Team. The key focus of the visit was on assessing the status of the green cover of the Institution, their waste management practices and energy conservation strategies etc. The sample collection (water, soil) was carried out during the visits. The water samples from one tubewell and two tap water sources were taken and soil samples from three different places of the campus was collected. The sample collection, preservation, and analysis were done in the scientific manner as prescribed by the standard procedures.

# Focus Group Discussion

The Focus Group discussions were held with the Sattvic Club, Bird Club members, staff members and the management focusing various aspects of Green Audit. The discussion was focused on identifying the attitudes and awareness towards environmental issues at the institutional and local level.

# Energy, waste management and Carbon foot print analysis Survey

With the help of teachers and students, the audit team has assessed the energy consumption pattern and waste generation, disposal and treatment facilities of the college. The monitoring was conducted with a detailed questionnaire survey method.

# Survey forms

1. **Water management**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No.** | **Parameters** | **Response** | **Remarks** |
| 1 | Source of water |  |  |
| 2 | No of Wells |  |  |
| 3 | No of motors used |  |  |
| 4 | Horse power – Motor |  |  |
| 5 | Depth of well –Total |  |  |
| 6 | Water level |  |  |
| 7 | Number of water tanks |  |  |
| 8 | Capacity of tank |  |  |
| 9 | Quantity of water pumped every day |  |  |
| 10 | Any water wastage/why? |  |  |
| 11 | Water usage for gardening |  |  |
| 12 | Waste water sources |  |  |
| 13 | Use of waste water |  |  |
| 14 | Fate of waste water from labs |  |  |
| 15 | Whether waste water from labs mixed with ground water |  |  |
| 16 | Any treatment for lab water |  |  |
| 17 | Whether any green chemistry method practiced in labs |  |  |
| 18 | No of water coolers |  |  |
| 19 | Rain water harvest available? |  |  |
| 20 | No of units and amount of water harvested |  |  |
| 21 | Any leaky taps |  |  |
| 22 | Amount of water lost per day |  |  |
| 23 | Any water management plan used? |  |  |
| 24 | Any water saving techniques followed? |  |  |
| 25 | Are there any signs reminding peoples to turn off the water? |  |  |

1. **Energy audit**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Room No. / name** | **Electrical device/ items** | **Number** | **Power** | **usage time (hr/day)** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Item: Bulbs (CFL, incandescent, LED); A/c, fan, computer, instruments

# Waste management

**Approximate quantity of waste generated per day (in kg)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Office*** |  |  |  |  |
| Approx | Biodegradable | Non -  biodegradable | Hazardous | Others |
| <1Kg |  |  |  |  |
| 2-10Kg |  |  |  |  |
| >10Kg |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Laboratories*** | |  |  |  |
| Approx | Biodegradable | Non -  biodegradable | Hazardous | Others |
| <1Kg |  |  |  |  |
| 2-10Kg |  |  |  |  |
| >10Kg |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Canteen/kitchen*** | |  |  |  |
| Approx | Biodegradable | Non -  biodegradable | Hazardous | Others |
| <1Kg |  |  |  |  |
| 2-10Kg |  |  |  |  |
| >10Kg |  |  |  |  |

**Total strength of students, teachers, and Non teaching staffs**

|  |  |  |
| --- | --- | --- |
| No of Students | |  |
| No of Teachers | |  |
| No of Non teaching staffs | |  |
| Gents |  |  |
| Ladies |  |  |
| Total |  |  |

**How the waste generated in the college is managed?**

|  |  |  |
| --- | --- | --- |
| A)Composting/  Vermicomposting | Yes/ No | Remark |
| B)Recycling |  |  |
| C)Reusing |  |  |
| D)Other ways |  |  |

**Waste generated in the college?**

|  |  |  |  |
| --- | --- | --- | --- |
| E-waste | | |  |
| Hazardous waste | |  |  |
| Solid waste | |  |  |
| Dry leaves | |  |  |
| Canteen waste | |  |  |
| Liquid waste | |  |  |
| Glass |  | |  |
| Unused  equipment | |  |  |
| Napkins | | |  |
| Others (specify) | |  |  |

|  |  |
| --- | --- |
| **Do you use recycled paper in college?** |  |
| **Any waste management methods used?** |  |

# Carbon foot print analysis

1. Total number of vehicles used by the stakeholders of the college.(per day)
2. No of cycles used
3. No of two wheelers used (average distance travelled and quantity od fuel and amount used per day)
4. No of cars used (average distance travelled and quantity od fuel and amount used per day)
5. No of persons using public transportation
6. No of persons using college conveyance
7. No of generators used per day
8. Amount of fuel used
9. Number of LPG cylinders used in canteen/lab
10. Use of any other fossil fuels in the college
11. Any suggestion to reduce the use of fuel

# AUDIT STAGE

Green auditing in **Paradip College, Paradip** began with the assessment of the status of the green cover of the Institution followed by waste management practices and energy conservation strategies etc. The team monitored different facilities at the college, determined different types of appliances and utilities (lights, taps, toilets, fridges, etc.) as well as measuring the usage per item (Watts indicated on the appliance or measuring water from a tap) and identifying the relevant consumption patterns (such as how often an appliance is used) and their impacts. The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances.

Data collection was done in the sectors such as Energy, Waste, Greening, Carbon footprint and Water use. College records and documents were verified several times to clarify the data received through survey and discussions. The environment samples including water, soil were from various location of the campus were collected and analyzed at Department of Zoology & Botany, Paradip College, Paradip.

**GREEN AUDIT REPORT**

**Water Quality assessment**

Water samples from four different locations were collected and analyzed for its quality parameters. The samples includes one Tube well water which are the main water source of the college campus and tap water samples which is used for canteen and drinking water cum cooler systems. The samples were collected, preserved and transported to Department of Botany& Zoology, Paradip College and analyzed for various physio-chemical parameters. The major parameters analyzed include dissolved oxygen, acidity, alkalinity, chloride, hardness, pH, conductivity, total dissolved solids and salinity. The results are presented in the Table 1. The results are comparable with the values of drinking water standards prescribed by different agencies.

**Table 1**:

**Results of water quality**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameters** | **Tube Well water** | **Tap water** | **Standard**  **value (BIS)** | **Remarks** |
| Dissolved Oxygen (mg/l) | 6.5 | 7.0 | 5-9 |  |
| Acidity (mg/l) | 46 | 53 | 200 |  |
| Alkalinity (mg/l) | 280 | 310 | 200-600 |  |
| Chloride (mg/l) | 410 | 500 | 250-1000 |  |
| Hardness (Total) | NIL | NIL | 200 |  |
| Conductivity (µs) | 1875 | 1412 |  |  |
| pH | 0.9 | 7.1 | 6.5-8.5 |  |
| Total Dissolved Solids  (ppm) | 340 | 210 | 500 |  |
| Salinity (ppt) | 1.8 | 0.7 |  |  |
| Total coliform | NIL | NIL | 0 |  |
| Fecal coliform | NIL | NIL | 0 |  |

# Water Management

The sources of water used in the College are one tube well and water supplied by PPT, Paradip a 2000litrs of water is stored in the tank and used for different purposes every day. Wastage of water from the lab is reduced by adopting micro scale analysis. An average of 30,000L of water is used by the College per month.

# Table 2.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl.No** | **Parameters** | **Response** | **Remarks** |
| 1 | Source of water | Water supply by PPT & Tube well |  |
| 2 | No of Wells | 01 |  |
| 3 | No of motors used | 3 |  |
| 4 | Horse power – Motor | 1.5HP-2  1HP-1 |  |
| 5 | Depth of well –Total | 1000ft - well no:1 |  |
| 6 | Water level | \_ |  |
| 7 | Number of water tanks | 03 |  |
| 8 | Capacity of tank | 20000 L-1  5000 L-1 |  |
| 9 | Quantity of water pumped every day | 5000L |  |
| 10 | Any water wastage/why? | 5-10L Overflow |  |
| 11 | Water usage for gardening | 120L/day |  |
| 12 | Waste water sources | Lab |  |
| 13 | Use of waste water | Used for Gardening |  |
| 14 | Fate of wastewater from labs | Gardeners |  |
| 15 | Any wastewater treatment for lab water | Yes(By PPT) |  |
| 16 | Whether any green chemistry method practiced in labs | No |  |
| 17 | Rain water harvest available? | No |  |
| 18 | No of units and amount of water harvested | No |  |
| 19 | Any leaky taps | Yes(2-3) |  |
| 20 | Amount of water lost per day | 5L |  |
| 21 | Any water management plan used? | No |  |
| 22 | Any water saving techniques followed? | Reuse |  |
| 23 | Are there any signs reminding peoples to turn off the water? | Yes |  |

**Soil Quality Assessment**

Soil samples were collected from four locations of the campus and analysed for the basic parameters. The results are tabulated and presented in the table 3.

**Table 3:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Locatio1** | **Location2** | **Location 3** | **Location 4** |
| pH | 6.8 | 7.3 | 6.1 | 6.6 |
| Total Kjeldhal Nitrogen (mg/kg) | 23mg | 34mg | 28mg | 30mg |
| Total organic carbon (%) | 1.1% | 2.5% | 1.5% | 3% |
| Phosphate (mg/kg) | 600mg | 580mg | 675mg | 700mg |

# Energy Audit Report:

Table 4 shows the energy consumption pattern of the college for a month. The college has consumed an average of 2,144.01kW/hr electricity in a month and the one year electricity bill amount was 1,97,090/-.

**Table 4:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl No** | | **Electrical appliances/instruments** | **Number** | | **Power (W)/u nit** | | **Tot al power (W)** | | **kW** | **Operation**  **/day** | | **kW/h r** | **No of days in month** | **Total consumption per month** | |
| 01 | | LED BULB | 10 | | 8 | | 80 | | 0.08 | 04 | | 0.32 | 24 | 7.68 | |
| 02 | | TUBE LIGHT | 51 | | 20 | | 1020 | | 1.02 | 05 | | 5.1 | 24 | 122.4 | |
| 03 | | PROJECTOR | 06 | | 245 | | 1470 | | 1.47 | 01 | | 1.47 | 10 | 14.7 | |
| 04 | | SPEAKERS | 2 | | 10 | | 20 | | 0.02 | 01 | | 0.02 | 10 | 0.2 | |
| 05 | | FAN | 139 | | 65 | | 9035 | | 9.035 | 05 | | 45.175 | 10 | 451.75 | |
| 06 | | COMPUTER | 40 | | 225 | | 9000 | | 9 | 05 | | 45 | 20 | 900 | |
| 07 | | TABLE FAN | 17 | | 12 | | 204 | | 0.204 | 04 | | 0.816 | 15 | 12.24 | |
| 08 | | PEDESTAL FAN | 10 | | 55 | | 550 | | 0.550 | 04 | | 2.2 | 15 | 33 | |
| 09 | | AQUA GUARD | 11 | | 30 | | 330 | | 0.330 | 02 | | 0.66 | 20 | 13.2 | |
| 10 | INKJET PRINTERS | | 04 | 25 | | 100 | | 0.1 | | | 02 | 0.2 | 15 | | 3 | |
| 11 | LASER PRINTERS | | 02 | 700 | | 1400 | | 1.4 | | | 01 | 1.4 | 15 | | 21 | |
| 12 | SCANNER | | 03 | 14 | | 72 | | 0.072 | | | 02 | 0.144 | 10 | | 1.44 | |
| 13 | STABILISER | | 05 | 1000 | | 5000 | | 5 | | | 01 | 5 | 20 | | 100 | |
| 14 | A/C | | 08 | 2500 | | 20000 | | 20 | | | 2 | 40 | 10 | | 400 | |
| 15 | REFRIGERATOR | | 05 | 150 | | 750 | | 0.750 | | | 2 | 1.5 | 10 | | 15 | |
| 16 | INVERTER | | 01 | 550 | | 550 | | 0.550 | | | 2 | 1.1 | 20 | | 22 | |
| 17 | EXHAUST FAN | | 05 | 50 | | 250 | | 0.250 | | | 4 | 1 | 24 | | 24 | |
| 18 | MICROPHONE | | 01 | 240 | | 240 | | 0.240 | | | 1 | 0.240 | 10 | | 2.40 | |

# Waste Management

Waste management is important for an eco friendly campus. In a college different types of wastes are generated, its collection and management are very challenging. The following data provide the details of the waste generated and the disposal method adopted by the college.

# Total number of stakeholders in the college: 1070

# Total number of building (Classrooms, canteen, office, auditorium, library etc): 09

**Table 5.**

**Different types of waste generated in the college and their disposal**

|  |  |  |
| --- | --- | --- |
| Types of waste | Particulars | Disposal method |
| E-Waste | Computers, electrical and electronic parts | Direct selling |
| Plastic waste | Pen, Refill, Plastic water bottles and other plastic containers, wrappers etc | Direct selling |
| Solid wastes | Damaged furniture, paper waste, paper plates, food wastes | Reuse after maintenance energy conversion |
| Chemical wastes | Laboratory waste | Neutralise with water |
| Waste water | Washing, urinals, bathrooms | Soak pits |
| Glass waste | Broken glass wares from the labs | Direct selling |
| Sanitary Napkin | - | Napkin Incinerators |

**Fig. 1 Per day waste generation in Class Rooms**

**Fig. 2 Per day waste generation in Office Waste**

## Waste management Practices adopted by the college

For the last few years, college is following zero organic waste protocol throughout the campus. The food waste generated by the students and staffs are taken by them to their own home, so that, minimum waste is generated inside the campus. In addition, the organic waste generated in the canteen is used as feed for biogas plant and the biogas is used as fuel in college canteen. Vegetable waste and other leaf litters were used to fed in the vermi-compost pit and the resulting vermin-cast is used as manure in the garden. The chemicals from the laboratories are disposed in a sealed tank along with water, so that the chemicals undergo neutralization with the water.

# Green Campus

Total number of plant species identified 42 Total numbers of plants in the campus 286

# Table 6.

# List of plants in the campus

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl No.** | **Plant’s Name** | **Scientific Name** | **No. of Plants** |
| 01 | Sacred Fig | Ficus Religiosa | 05 |
| 02 | Indian Mast Tree | Monoon Longifolium | 29 |
| 03 | Orchid Tree | Bauhinia Variegata | 05 |
| 04 | Sterculia Lanceolata | Sterculia Lanceolata | 02 |
| 05 | Rosary Pea | Abrus Precatorius | 02 |
| 06 | Dwarf Umbrella Tree | Schefflera arboricola | 10 |
| 07 | Bande Lata | Spatholobus Parviflorus | 01 |
| 08 | Lolly Bush | Clerodendrum Floribundum | 02 |
| 09 | Champa Flower | Michelia | 02 |
| 10 | Lemon Tree | Citrus Limon | 01 |
| 11 | Dry Plums | Prunus Domestica | 03 |
| 12 | Mango Tree | Mangifera Indica | 04 |
| 13 | Sahjan Tree | Moringa Oleifera | 01 |
| 14 | Banana Tree | Musa Acuminata | 07 |
| 15 | Neem Tree | Azadirachta Indica | 04 |
| 16 | Eucalypts | Eucalyptus Globulus | 07 |
| 17 | Crown Flower | Calotropis Gigantea | 12 |
| 18 | Casuarina | Casuarina Equisetifolia | 05 |
| 19 | PinWheel Flower | Tabernalmontana Divaricata | 01 |
| 20 | Table Palm | Livistona Rotundifolia | 01 |
| 21 | Indian ginseng | Withania Somnifera | 02 |
| 22 | Money Plant | Epipremnum Aureum | 01 |
| 23 | Madagascar Periwinkle | Catharanthus Roseus | 14 |
| 24 | Hydrangea | Hydranged Macrophylla | 03 |
| 25 | Hibicus | Hibicus Rosa-Sinersis | 03 |
| 26 | Yellow Wood Sorrel | Oxalis | 01 |
| 27 | Synedrella | Synedrella | 01 |
| 28 | Ocotea Puberula | Ocotea Puberula | 02 |
| 29 | Hopbush | Dodonaea Viscosa | 02 |
| 30 | Veld Grape | Cissus Quadrangularis | 01 |
| 31 | Greater Galangal | Alipinia Galanga | 01 |
| 32 | Amaran Thus | Amaranthus Dubicus | 01 |
| 33 | Shame Plant | Mimosa Pudica | 01 |
| 34 | Mugwort Plant | Artemisia Vulgaris | 01 |
| 35 | Acacia | Acacia | 17 |
| 36 | Cratoxylum | Cratoxylum Cochinchinese | 01 |
| 37 | Arjun Tree | Terminalia Arjuna | 05 |
| 38 | Persian Silk Tree | Albizia Julibrissin | 06 |
| 39 | Coconut Tree | Cocos Nucifera | 15 |
| 40 | Dogbanes | Apocynaceae | 02 |
| 41 | Common Guava | Psidium Guajava | 04 |
| 42 | Lophomyrtus | Lophomyrtus Obcordata | 01 |
| 43 | Brazilwood | Paubrasilia Echinata | 01 |
| 44 | Giant Calotrope | Calotropis Gigantea | 01 |
| 45 | Sabal Mexicana | Sabal Mexicana | 01 |
| 46 | Salix Alpina | Salix Alpina | 01 |
| 47 | West Indian Lantana | Lantana Camara | 01 |
| 48 | Sand Forest Arum | Gonatopus | 01 |
| 49 | Heart-leaved Moonseed | Tinospora Cordifolia | 01 |
| 50 | Persimmons | Diospyros | 01 |
| 51 | Shining Sumac | Rhus Copallinum | 03 |
| 52 | Drumstick Tree | Moringa Oleifera | 01 |
| 53 | Boxelder Maple | Acer Negundo | 01 |
| 54 | Alternanthera | Alternanthera Sessilis | 01 |
| 55 | Paracress | Acmella Oleracea | 01 |
| 56 | Parrotia Persica | Parrotia Persica | 01 |
| 57 | Garcinia Cowa | Garcinia Xanthochymus | 01 |
| 58 | Eleocarpus | Eleocarpus Grandis | 01 |
| 59 | Salix Lucida | Shining Willow | 01 |
| 60 | Corchorus | Corchorus Olitorious | 01 |
| 61 | Yellow Oleander | Cascabela Thevetia | 03 |
| 62 | Pongamiq | Millettia | 01 |
| 63 | Sapodilla | Manilkara Zapota | 01 |
| 64 | Flora Stinging | Urtica Dioica | 01 |
| 65 | Gale of the Wind | Phyllanthus Niruri | 01 |
| 66 | Bush Clover | Lespedeza Bicolor | 01 |
| 67 | Red Russian Kale | Brassica Napus Vapabularia | 02 |
| 68 | Holy Basil | Ocimum Tenuiflorum | 05 |

# Campus Farming

The college has started a bird nesting in the college campus in collaboration with “Adarsha Prayash” to give shelter to birds.

# Routine Green Practices

Every year college celebrates World Environment Day, World Water Day and Ozone Day in the campus. The main focus of these programmes was to provide awareness to the students about the importance of the environment, its conservation and sustainable use of environmental resources. The programmes are conducted through seminars, poster presentation, quiz competition debates etc.

# Carbon Foot Print Analysis

1. Total number of vehicles used by the stakeholders of the college : 25
2. Number of cycles used 10
3. No: of two wheelers used 4Km (to & fro)

Average distance travelled : 4km Average quantity of fuel used : ½ Ltr

1. No: of cars used :01

Average distance travelled : 04

Average quantity of fuel used: 1ltr

1. No: of persons using public transportation : 700
2. No: of persons using college conveyance : 00
3. No: of generators used per day : 00
4. Amount of fuel used : 60 Ltr
5. No: of LPG cylinders used in canteen/ Labs : 13
6. Use of any other fossil fuels in the college : No
7. Any suggestion to reduce the use of fuel :NIL

**SUGGESTIONS AND RECOMMENDATIONS**

**Water Management**

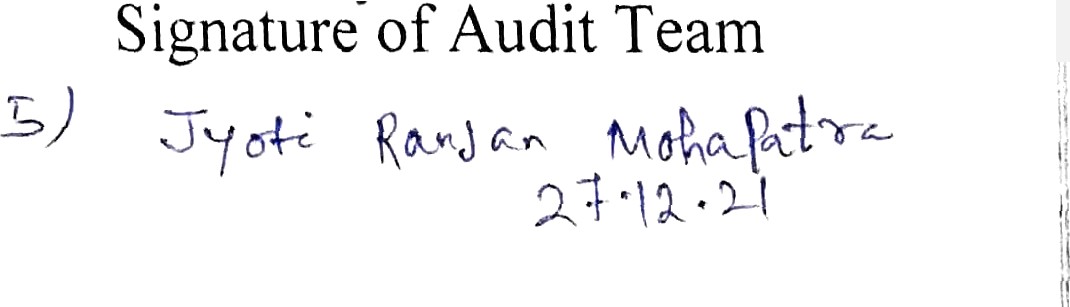
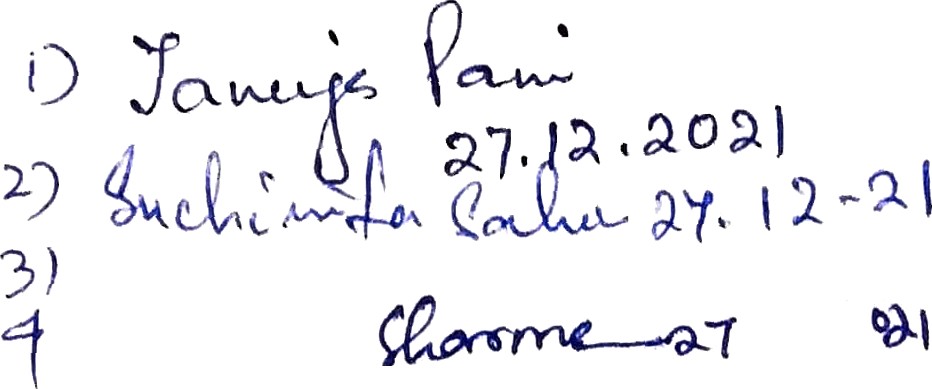
* The water sources are safe in terms of contamination. The students are taking back the food waste as per the zero waste management strategy of the college. It helped in reducing the consumption of water for washing.
* The college needs to have rain water harvesting system. The institution should organize more awareness programmes for water conservation. There should be a proper monitoring of water conservation pattern in the campus.

**Energy management**

* The energy audit recommend to avoid the use of more energy consuming electrical appliances and to replace with more environment friendly and energy efficient appliances (for example five stars rated Air conditioner) in the college. The potential of renewable energy sources have to be explored. As the college has a very large roof area for installing solar panels so that it can be effectively used for generating power. The college has started steps in installing the solar panels for office.
* It is recommended to install one solar powered appliance in the campus.

**Green Campus**

* In order to increase the carbon credit and greenery of the campus, it is recommended to plant more indigenous and evergreen / fruit trees inside the campus.



**Waste Management**

* Try to avoid the use of plastic in the campus, and to encourage the use of biodegradable materials as alternatives. Try to achieve the goal of plastic free campus.
* Leaf litter from the campus can be effectively used for aerobic/ vermi composting, so that the composted material can also be used as good manure.
* Recycle the paper waste instead of incinerate or burning.



Principal

Paradip College, Paradip