GREEN AUDIT REPORT

2022-23

DHENKANAL AUTONOMOUS COLLEGE, DHENKANAL

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GREEN AUDIT TEAM

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1. 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 conduction of Green Auditing of institution is essential. The green auditing of Dhenkanal Autonomous College enables to assess the life style, action and its impact on the environment. In this report Green Audit comprises Green Audit, Environmental Audit and Energy Audit of this institution. Henceforth, the term Green Audit will imply all the above three audits. 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 staffs 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.

2. INTRODUCTION

About college

Established in 1959 at the backdrop of a picturesque landscape, Dhenkanal Autonomous College has carved a niche for itself in academic excellence not only in the state but in the country as well. The results of the students testify to this honour. However, with an endless pursuit of excellence as its motto, the College is forever making an endeavor to excel itself. To achieve this, it emphasizes strategic planning that assesses its current functioning and the modus operandi of executing a higher mission that includes such crucial aspects as financial planning, budgeting, staffing, and academic programming, which, in turn, would essentially relate to matching institutional commitments and the real, concrete benefits to the students.

After getting Autonomous status in 2002 the college intended to materialize many plans to enhance the quality of the institution. Its primary mission is to lay out the utmost emphasis on academic excellence, research, innovation, and other extension activities to reach the pinnacle of glory. It aims at effecting radical changes in the syllabi of all the programmes and pedagogy. In this respect, the college is a pioneer in adopting the Choice Based Credit System syllabus in 2016. The CBCS courses for all programmes have been designed based on UGC guidelines. Though the courses are mainly influenced by the model syllabus prescribed by Utkal University, many departments have modified the courses up to a certain extent to cater to the needs of local requirements. In these years, several steps have been taken for examination reforms, automation of the library, online management of accounts, e-administration, e-admission, and the upgrade of Management Information Systems. Due to these initiatives, the college is now a leading feeder college for institutes of national repute like the IITs, IIMs, Central Universities, and other State Universities. Many employers are now being attracted to our institutions because of the requirement for quality human resources in terms of skill, knowledge, and values.

The institute provides equal importance to develop a research culture among its students and teachers. As regards the improvement of academic excellence of teachers, they are encouraged to participate in various FDPs, seminars, conferences, refreshers, and orientation courses. For the all-around development of the students, the college offers various extension activities like NCC, NSS, YRC, Rover & Ranger, Sports facilities, Dramatic and other Cultural Activities. The institution aims at developing intellectually fit, environmentally conscious, and socially committed citizens. By fostering a culture of values, critical thinking, reaffirming human rights, and promoting gender justice, the college strives to

create a learner-friendly, progressive, and democratic environment. The college has a robust grievance redressal mechanism for all its stakeholders.

This pantheon of wisdom and coliseum of learning, situated in the sylvan setting of forests, hills, and mango groves has promised to achieve the goals and objectives in every aspect/field with the untiring efforts of its teaching and supporting staff. The mission and vision of this premier institute are embedded in the crest of the college.

PROFILE OF THE COLLEGE:

Name of College	**:**	**Dhenkanal Autonomous College**
Name of Principal	**:**	**Sri Ranjit Kumar Pradhan (OES-I)**
Year of establishment	**:**	**7th January 1959**
Whether private or government or university maintained	**:**	**Government**
Year of grant of permanent affiliation	**:**	**01.02.1967**
Date of conferment of Autonomy	**:**	**2002**
Certificate of 12B and 2f	**:**	**The College is enlisted under 12B and 2f, U.U; Dt.27.03.1982**
Date of NAAC accreditation	**:**	**Jan-2017-Jan-2022 and extended to Dec-22**
Grade	**:**	**B++**
CGPA marks	**:**	**2.83**
Website		**www.dhenkanalcollege.nic.in**
Telephone/Fax	**:**	**06762-224420/ 06762-226885**
E-mail	**:**	principaldklcol@yahoo.in

VISION STATEMENT OF THE COLLEGE

To be a centre of excellence and eminence by imparting comprehensive education to develop a young generation physically, mentally, intellectually, and ethically; promoting the holistic growth of its stakeholders; and contributing to the transformation of society through continuous innovation in education, research, and creativity.

MISSION STATEMENT OF THE COLLEGE

- To achieve academic excellence through innovative teaching and learning practices.
- To provide a context of learning that enhances professionalism, humanism and social responsibility.

- To ensure learner-friendly, progressive and democratic ambience that fosters critical thinking, respect for human rights and gender justice.
- To impart value based quality education that makes the students intellectually fit, socially committed and ecologically conscious.

MOTTO

“Sa Vidya Ja Vimuktaye”
(Knowledge is one that liberates)

LOCATION OF THE COLLEGE

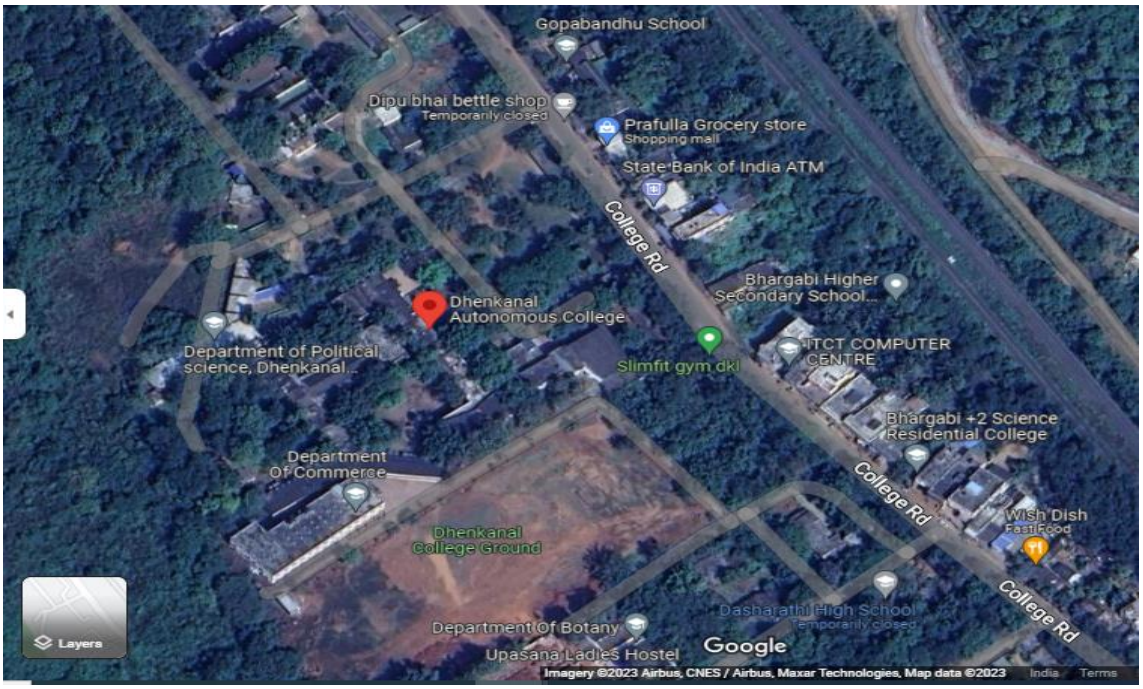


Fig. 1 Location of Dhenkanal Autonomous College

(JJR8+G36, College Rd, College Chowk, Kunjakanta, Dhenkanal, Odisha 759001)

SCENIC VIEW OF THE INSTITUTION AT A GLANCE

Drone View of the front side of the college

Drone View of the back side of the college

View from the Playground side

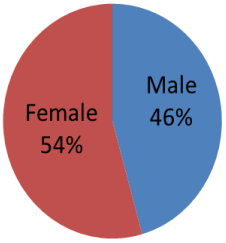
COURSES OFFERED BY THE COLLEGE

Total P G Courses (14)	Courses offered by the College	
Regular Courses (12)	M.Com	M.Com (Accounting & Finance)
	M. Sc.	M.Sc. Botany, M.Sc. Chemistry, M.Sc. Mathematics, M.Sc. Physics, M.Sc. Comp. Science
	M.A	MA Odia, MA English, MA Economics, MA Philosophy, MA Psychology, MA History
Self-Financing (02)	MBA	
	M. Sc. (Comp Science)	
Total UG Courses (20)	**Courses offered by the College**	
Regular Courses (20)	B.Com	B.Com (Accounting)
	B. Sc.	Botany, Chemistry, Mathematics, Physics, Comp. Science, Zoology, Bio-Technology
	B.A	Odia, English, Economics, Philosophy, Psychology, History, Pol. Science, Sanskrit, Sociology, Education, Hindi, Mathematics

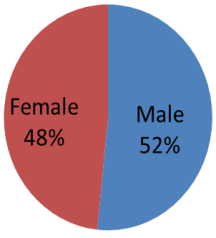
THE STUDENT AND FACULTY STRENGTH OF THE COLLEGE IS LISTED BELOW:

No of students		2017
No of teachers		91
No of Non-teaching staffs		49
Male	1001	
Female	1156	
Total		**2157**

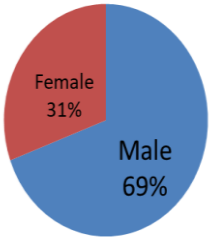
No of Students



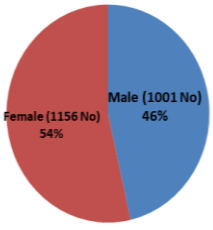
No of Teaching Staffs



No of Non-teaching Staffs



Stakeholders of the Institution



INFRASTRUCTURE:

Land:

The Dhenkanal Autonomous College, Dhenkanal has a large area spanning over **56** acres of land. The college building houses several infrastructural facilities including staff quarters, library and playground apart from the administrative and academic building. The college has three gardens named as ***Lumbini***, ***Eden & Herbal*** Garden. Besides these three Garden, few small floral gardens are created and maintained by YRC, NSS and various departments. The college is situated at the foot of **"Pani Ohala**" Hillock and abuts NH-55. Its contiguity to the town is a distinct advantage. The various infrastructural facilities available are detailed below.

Infrastucture Type	Numbers
Classrooms	
Lecture Theater	6
Classroom	66
Seminar Rooms	15
ICT enabled Classrooms	10
Laboratories	
Physics	5
Chemistry	4
Botany	3
Zoology	2
Computer Science	1
Psychology	1
Professional studies	1
Central Computer Lab	1
Language Laboratory	1
Common Room	
Boy's common Room	1
Girl's common Room	1
Staff common Room	1
Departmental Common Room	10
Office	
Principal's Chamber	1
Administative Block	6

ICT Enabled Classroom

Laboratories

SAMS Lab.	2
Stores	
General stores	1
Departmental stores	6
Library	
Reference Library	1
General Library	1
Departmental Library	15
Reading Room	1
MBA Dept	1
Lavatory for Student	
Boys'	12
Girls'	12
Lavatory for Staff	
Gents	6
Ladies	6
Others	
NCC room	1
NSS room	1
Red Cross room	1
Post office	1
Canteen	1
Students Union Room	1
Gymnasium	2 (1 Open Gym)
Auditorium	1
Networking Centre	1
Playground	1

Computer Laboratory

Gym

Open Gym

Playground

FACILITIES:

Auditorium/seminar complex	ATM Attached to the Campus wall
Sports facilities	Post office
Play ground	Book shops Attached to the Campus wall
Gymnasium	Power house
Hostel for Girls and Boys	Waste management facility
Residential facilities 1. for teaching staff 2. for non-teaching staff	Rain water Harvesting Facility
Canteen	Language lab
First aid facility	Smart class room. ICT provision in few departments
Environment Friendly Campus	Wi Fi Campus
Automated operation in Library	Software courses facilitated to students through joint venture
Reading Room	Guest House

3. OBJECTIVES OF GREEN AUDIT

In this report Green Audit comprises Green Audit, Environmental Audit and Energy Audit of this institution. Henceforth the term Green Audit will imply all the above three audits. The main aim objectives of this green audit are to assess the environmental quality and the management strategies being implemented in Dhenkanal Autonomous College, Dhenkanal. The specific objectives are:

1. To assess the quality of the water and soil in the Dhenkanal Autonomous 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 Dhenkanal Autonomous College have helped to reducethe Carbon Footprint.

6. To suggest environment management plans to the college.
7. Providing a database for corrective actions and future plans.
8. To assess whether 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 the Dhenkanal Autonomous College.

4. TARGET AREAS OF GREEN AUDITING

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 , economic efficiency and also to maintain the greenery of the campus.

All these indicators are assessed in the process of "Green Auditing 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.

Auditing 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 auditing 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. Bio-degradable wastes include food wastes, canteen waste, wastes from toilets etc. Non-biodegradable wastes include what is usually thrown away 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 we 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 us.

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 transportation that is practiced in the college is important.

5. METHODOLOGY ADOPTED

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

Onsite Visit

Seven days 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 different open wells and tap water sources were taken and soil samples from 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 and suggestions were also taken from different expert groups for the compilation of the audit data.

Focus Group Discussion

The Focus Group discussions were held with the students, staff members and the management focusing various aspects of Green Audit. The discussion was focused on identifying the attitudes and awareness towards environmental issuesat 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.

Application of secondary sources

While conducting this survey, some useful research articles and data are used and incorporated in this audit work.

7. AUDIT PROCESS

Green auditing in **Dhenkanal Autonomous College** 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, fans, ACs, 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 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 through various experts in the field.

8. GREEN AUDIT REPORT

Water Quality assessment

Water samples from four different locations were collected and analyzed for its quality parameters. The samples includes two well water which are the main water source of the college campus and two tap water samples which is used for canteen and drinking water cum cooler systems. The samples were collected and sent to the Public Health Engineering Department 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. The results are comparable with the values of drinking water standards prescribed by different agencies.

RESULTS OF WATER QUALITY					
PARAMETERS	**PRODUCTION WELL WATER-1**	**PRODUCTION WELL WATER-2**	**TAP WATER-1**	**TAP WATER-2**	**STANDARD VALUE (BIS)**
Dissolved Oxygen (mg/1)	6.73	6.51	7.32	7.51	06-08
Acidity (mg/1)	55	53	23	24	200
Alkalinity (mg/1)	22	24	21	20	200
Chloride (mg/1)	27	25	35	20	250
Hardness (Total)	1.5	1.5	1.5	1.5	200
Conductivity	140	100	160	100	
pH	6.5	6.4	6.5	6.7	6.5-8.5
Total Dissolved Solids (ppm)	105	94	105	100	500
Salinity (ppt)	0.01	0.01	0.01	0.01	
Total coli form	NIL	NIL	NIL	NIL	0
Fecal Coli form	NIL	NIL	NIL	NIL	0

Source: *Samples tested and collected from the Public Health Engineering* Department *and compiled by the Audit team.*

Water Management

The sources of water used in the College are five bore wells present in the campus. A total of 52000L of water is pumped out from the well every day (Table). An average of 12,00,000 L of water is used by the College per month. The water management practices of the institution is analysed in the table below:

WATER MANAGEMENT PRACTICES			
Sl. No.	**PARAMETERS**	**RESPONSE**	**REMARKS**
01	Source of Water	Production Well	Ground Water
02	No. of Production Wells	5	
03	No. of Meters Used	7	
04	Horse Power – Meter	3HP= 5no, 5HP = 2no	
05	Depth of Well – Total	Production Well no -1 to 5 = 120m each	
06	Water Level	12m	
07	No. of Water Tanks	1000L capacity = 50no	
08	Capacity of Tank	50no 1000L	
09	Quantity of Water Pumped every day	52000L	
10	Any water wastage why	NIL	
11	Water usage for gardening	500L/day	
12	Waste water sources	Lab, canteen	
13	Use of waste water	Nil	
14	Fate of wastewater from labs	After neutralization waste water iskept in a large covered pit	
15	Any wastewater treatment for lab water	No	
16	Rain water harvest available?	Yes (5 earmarked Places)	Photo of the same enclosed
17	Any leaky taps	No	
18	Amount of water lost per day	Nil	
19	Any water management plan used?	Water management audit conducted	
20	Any water saving techniques followed?	Nil	
21	Are there any signs reminding peoples to turn off the water?	Yes	

Source: *Data collected from the Public Health Engineering* Department, *analysed and compiled by the Audit team.*

Soil Quality assessment

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

SOIL QUALITY ASSESSMENT OF COLLEGE CAMPUS					
Parameter	**Location - 1(Play ground**	**Location - 2(Lumbini Garden)**	**Location - 3(boys Hostel Campus**	**Location -4 (Garden of Botany Dept.)**	**Location - 5(Near Auditorium)**
pH	6.2	6.8	6.6	6.3	6.7
Organic Carbon (%)	0.57	1.09	0.86	1.1	0.72
Total P(Kg/hectare)	2.6	3.9	3.2	3.6	2.8
K(potassium in Kg/ hectare)	53	57	49	62	58
Moisture content (%)	5.8	7.3	5.3	6.9	6.4

Source: *Sample collected and analyzed by the Audit team with the help of PG Department of Botany.*

Energy Audit Report

Table shows the energy consumption pattern of the college for a month. The college has consumed an average of 7853 KW/hr electricity in a month and the one year electricity bill amount was around Rs 5,08598/-. (Approx.). Here assumptions have been taken that Heating Degree Days, Colling Degree Days and Holiday are 5 Months, 6 Months & 1 Month respectively. In Heating degree days the consumption of electricity is much more than the Cooling Degree Days and one month has been deducted as there is minor consumption of electricity in Summer Vacation. In heating degree days Average Monthly Consumption is Rs 56801 while the same is Rs 37433 in Cooling degree days. The details are given in the table below:

AVERAGE ELECTRICITY CONSUMPTION COMPUTATION												
Sl No	Electrical Appliances/Instruments	Number	Power (W)/ unit	Total power (W)	KW	Heating Degree Days		Cooling Degree Days		No of days in month	Heating Degree Days	Cooling Degree Days
						Operation/day (Hours)	KW/ hr	Operation/day (Hours)	KW /hr		Total consumption per month (KW/hr)	Total consumption per month (KW/hr)
1	CFL	82	14	1148	1.148	6	6.888	6	6.888	25	172	172
2	TUBE LITE	230	40	9200	9.2	6	55.2	6	55.2	25	1380	1380
3	LED BULB	203	9	1827	1.827	6	10.962	6	10.96	25	274	274
4	LED TUBE	109	20	2180	2.18	6	13.08	6	13.08	25	327	327
5	HALOGEN LIGHT	25	200	5000	5	6	30	6	30	25	750	750
6	PROJECTOR	15	280	4200	4.2	3	12.6	3	12.6	20	252	252
7	FAN	163	60	9780	9.78	5	48.9	0	0	20	978	0
8	COMPUTER	159	200	31800	31.8	4	127.2	4	127.2	20	2544	2544
9	LAPTOPS	18	50	900	0.9	4	3.6	4	3.6	20	72	72
10	PRINTERS	25	60	1500	1.5	2	3	2	3	20	60	60
11	A/C	25	1500	37500	37.5	4	150	0	0	15	2250	0
12	REFRIGERATOR	5	150	750	0.75	7	5.25	7	5.25	30	158	158
13	OTHER ELECTRICAL EQUIPMENTS										50	50
14	LAB EQUIPMENTS										200	200
										GROSS TOTAL	**9467**	**6239**
										Average Consumption P.M.	**7853**	
										Unit Price of Electricity (Average Rate in Rs.)	**6**	
										Average Monthy Consumption (Rs)	**56801**	**37433**
										Average Yearly Consumption (Rs)	**508598**	

Waste management

Waste management is important for an ecofriendly 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: **2157**

Total number of Blocks: (Class rooms, canteen, office, auditorium, library, hostels, Guest House etc): **09**

Different types of waste generated in the college and their disposal

Types of waste	Particulars	Disposal method
E-Waste	Computers, electrical and electronic parts	Disposal through govt. procedure
Plastic waste	Pen, Refill, Plastic water bottles and other plastic containers, wrappers etc	Disposal through govt. procedure
Solid wastes	Damaged furniture, paper waste, paper plates, food wastes	**Damaged furniture**-Reuse after maintenance **Paper waste,paper plates**- Given to Municipality for recycling **Food wastes**- Used for compost preparation for College garden
Chemical wastes	Laboratory waste	Neutralise with water and disposed inside pit
Waste water	Washing, urinals, bathrooms	Soak pits
Glass waste	Broken glass wares from the labs	Disposal through govt. procedure

Waste management Practices adopted by the college

For the last few years, college is following plastic free campus. All the stakeholders are motivated to adopt the practices by the college administration. The food waste generated

by the students and staffs and the organic waste generated in the canteen are used to prepare the compost for the college garden. Vegetable waste and other leaf litters were used to feed in the vermi-compost pit and the resulting vermin-cast is used as manure in the garden. The chemicals from the laboratories are disposed ina sealed tank along with water, so that the chemicals undergo neutralization with the water. Separate dustbins have been used near the classrooms to collect daily garbage and accumulated in the separate waste collection tank inside the various location of the campus.

Waste Storage Tank

Small Dustbins for Waste Collection

GREEN CAMPUS

Dhenkanal Autonomous College is surrounded by trees and small hills on all sides. Green environment is always a priority for its stakeholders. The institution gained familiarity in 2017 when awarded with ***"Prakrutimitra Award"*** by the Department of Forest and Environment, Govt of Odisha for its clean, green and environment friendly campus. The total number of plant species identified is 77. (As per the data of PG Department of Botany, Dhenkanal Autonomous College.)

Sl. No	Scientific name	Family	Common name in Odia	No of plants
1	*Tabernaemontana divaricata*	apocyanaceae	Tagara	8
2	*Tectona grandis*	Lamiaceae	Saguan	132
3	*Senna occidentalis*	Fabaceae	Chakunda	130
4	*Aegle marmelos*	Rutaceae	Bela	33
5	*Azadirachta indica*	Meliaceae	Limba	97
6	*Mangifera indica*	Anacirdiaceae	Amba	109
7	*Phyllanthus imblica*	Phyllanthaceae	Amla	29
8	*Pterocarpus marcupium*	Fabaceae	Asana	11
9	*Bambusa vulgaris*	Poaceae	Baunsa	9
10	*Pterospermum marsupium*	Fabaceae	Muchukunda	4
11	*Murraya koenigii*	Rutaceae	Versunga	21
12	*Dalbergia sissoo*	Fabaceae	Sisoo	6
13	*Borassus flabellifer*	Arecaceae	Tala	4
14	*Syzygium cumini*	Mytraceae	Jamu	8
15	*Monoon longifolium*	Annonaceae	Debadaru	82
16	*Delonix regia*	Fabaceae	Krushnachuda	133
17	*Mimusops elengi*	Sapotaceae	Baula	14
18	*Cassia fistula*	Fabaceae	Sundari	7
19	*Strychnos nux-vomica*	Loganiaceae	Kochila	7
20	*Millettia pinnata*	Fabaceae	Karanja	12
21	*Ceiba pentardra*	Malvaceae	White silk cotton	1
22	*Cedrela salvedorensis*	Meliaceae	Cedrela	7
23	*Fraxinus ameracana*	Oleaceae	Whiteash tree	8
24	*Hiptage benghalensis*	Malpighiaceae	Madhabilata	4
25	*Madhuca longifolia*	Sapotaceae	Mahula	1
26	*Terminalia arjuna*	Combretaceae	Arjuna	10
27	*Moringa oleifera*	Morimgaceae	Sajana	2
28	*Ziziphus jujuba*	Rhamnaceae	Barakoli	5
29	*Dypsis lutescens*	Arecaceae	Areca palm	34
30	*Combretum indicum*	Combretaceae	Madhumalati	3
31	*Tinospora cordifolia*	Menispermaceae	Geloy	3
32	*Punica granatum*	Lythraceae	Dalimba	6
33	*Cycas revoluta*	Cycadaceae	Veru	8
34	*Dracaena sp.*	Asparagaceae	Dracaena	21
35	*Dracaena fragrance*	Asparagaceae	Dracaena	23
36	*Citrus limon*	Rutaceae	Lembu	5
37	*Bryophyllum pinnatum*	Crassulaceae	Amar poi	3
38	*Duranta repens*	Verbenaceae	Goldenia	1742
39	*Prunus amygdalus*	Rosaceae	Pesta badam	7
40	*Cascabela thevetia*	Apocyanaceae	Kaniar	11
41	*Artocarpus heterophyllus*	Moraceae	Panasa	2
42	*Diospyrus ebenum*	Ebenaceae	Ebony diospyrum	1
43	*Platycladus orientalis*	Cupressaceae	Oriental arbor	22
44	*Ficus racemosa*	Moraceae	Dimiri	37
45	*Bougainvillea*	Nyctagiraceae	Kagaj fula	13
46	*Citrus medica*	Rutaceae	Kandhia	6
47	*Ficus benghalensis*	Moraceae	Bara gachha	5
48	*Psidium guajava*	Mytraceae	Pijuli	8
49	*Lawsonia inermis*	Lythraceae	Manjuati	2

50	*Saraca asoca*	Leguminosaceae	Ashok	2
51	*Justicia adhatoda*	Acanthaceae	Gayasa	2
52	*Terminallia belliria*	Combretaceae	Bahada	3
53	*Neolamrckia cadamba*	Rubiaceae	Kadamba	7
54	*couroupita guianensis*	Lecythidaceae	Nagacampa	2
55	*Cocos nucifera*	Arecaceae	Nadia	8
56	*Dillenia indica*	Dilleniaceae	Ou	10
57	*Ficus elastica*	Moraceae	Rabara	3
58	*Terminalia chebula*	Cobretaceae	Harida	1
59	*Magnolia champaca*	Mangoliaceae	Champak	1
60	*Calophyllum inophyllum*	Clusiaceae	Pengalaut	1
61	*Codiaum variegatum*	Euphorbiaceae	Gardencroton	58
62	*Ophiopogon planiscapus*	Asparagaceae	Blackmondo	4
63	*Cenchrus americanus*	Poaceae	Pearl millet	2
64	*Spathodea campanulata*	Bignoniaceae	African toulip	3
65	*Nerium oieander*	Apocyanaceae	Nerium	5
66	*Dahlia*	Asteraceae	Dahlia	45
67	*Musa sp.*	Musaceae	Kadali	7
68	*Hibiscus*	Malvaceae	Manda ra	8
69	*Chrysanthemum indicum*	Asteraceae	Sebati	20
70	*Rosa sp.*	Rosaceae	Golapa	17
71	*Saussurea obvallata*	Asteraceae	Brahmakamal	1
72	*Ficus geniculata*	Moraceae	Putkal	2
73	*Murrya paniculata*	Rutaceae	Orange jasmin	6
74	*Jasminum*	Oleaceae	Malli	10
75	*Portulaca umbraticola*	Portulaceae	Wingpod purslane	6
76	*Millingtonia hortensis*	Bignoniaceae	Indian cork	61
77	*Stereospermum kunthianum*	Bignoniaceae	Droppy leaf	8

(Note: The number of trees may vary but special care has been taken to reduce the variation)

CARBON FOOT PRINT ANALYSIS

1. Total number of motor vehicles used by the stakeholders of the college : 1500 (Approx)

2. Number of cycles used : 800 (Approx)

3. No of two wheelers used : 400 (Approx)

Average distance travelled : 10 kmAverage quantity of fuel used : 0.25 Ltr

4. No of cars used : 10

Average distance travelled : 50 km

Average quantity of fuel used (15 km/Ltr): 500 Km/15= 34 ltr

No: of persons using public transportation : 300

5. No of persons using college conveyance : ----

6. No of generators used per day : Using 10 hrs / Month

7. Amount of fuel used : 30 Ltr

8. No of LPG cylinders used in canteen/ Labs: 5 No. (14 ltr tank)

9. Use of any other fossil fuels in the college: No.

10. Any suggestion to reduce the use of fuel :-----

REGULAR GREEN PRACTICES :

1. Every year college celebrates World Environment Day, World Water Day and Ozone Day in the campus. The main focus of these programems 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.
2. Every year during the month of July, plantation programme ***'Bano Mahostav'*** is undertaken by volunteers of YRC, NCC and NSS Unit of this institution.
3. Botany department has designed some projects in which students identifying rare and valuable plants and have taken steps to protect them inside the campus.
4. All the departments have taken steps to keep indoor plants for the internal beauty of the departments.
5. With the help of District administration, Rain water harvesting and Ground water restoring projects are initiated in the college campus.
6. All stakeholders are instructed by the college administration to switch off all the electrical

appliances and instruments immediately after its use.

7. Awareness programmes are being conducted on regular basis to educate all the stakeholders regarding the conservation of energy.

FUTURE INITIATIVES:

1. Installation of solar panel for electricity generation.
2. Adoption of 'No vehicle day' to conserve energy.

9. SUGGESTIONS AND RECOMMENDATIONS

Water Management

1. In consultation with District Administration one water reservoir should be built up on the upper part of the college, base of Pani Ohala Pahada to store rain water.
2. The wells can be recharged with rainwater from rooftops of new building. The area of the rooftop can be used for the collection of rain water.
3. Rainwater for laboratory purposes – Construction of rainwater harvesting tank can satisfy the need of laboratory.

Energy management

1. 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.
2. 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 should take steps in installing the solar panels for office.
3. It is recommended to install solar powered street lights and LED display board Green Campus.
4. 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

1. Encourage the use of biodegradable materials as alternatives. Try to achieve the goal of plastic

free campus.

2. 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.
3. Recycle the paper waste instead of incinerate or burning

Green Campus

1. Along with plantation, special care should be given for the maintenance of the plants inside the college campus. All the stakeholders should be involved in the process.
2. Recommendation for a full time gardener for the maintenance of garden and plants.
3. Rare plants should be identified and earmarked.
4. The patch of land surrounded by the Department of Pol. Science, Economics, Philosophy, Sanskrit, Physics etc. is a protected one. So fruit-yielding trees like Mango, Jackfruit, Guava etc. should be planted.
5. Each staff of the college will plant a tree and named the plant on his/her own name and look after same till its growth. This enables a healthy competition among the stakeholders for the promotion of Green environment.

AUTHORISED SIGNATORIES OF AUDIT TEAM

1. Dr. Debasis Mohanty — 4.11.2022
2. Dr. Aniruddha Kumar Khilar — 04/11/22
3. Dr. Debraj Parida — 04/11/22
4. Dr. Rajanikanta Khuntia — 04.11.2022

AUDIT REPORT SUBMITTED TO:

04/11/22

Principal,

Dhenkanal Autonomous College,

Dhenkanal

PRINCIPAL
DHENKANAL (AUTO) COLLEGE
DHENKANAL

DHENKANAL AUTO. COLLEGE ESTD:1959 DHENKANAL