Green & Environmental Audit Report 2022-23

PREFACE

The future of humankind depends very much on our ability to change our lifestyles and agree to follow a low consumption pattern of living in terms of resources taken from the globe and return to a sustainable development path at the earliest. Climate around the world – in developed as well as developing regions – has started showing violent changes, destroying life and property and annihilating peaceful living conditions. The opportunity window for restoring nature to its prolonged state of hosting life forms to flourish under its caring environs is according to scientists, very short and lasting only up to 2030. Within this time, with the willing actions of every citizen wherever they are, coordinated and directed actions should start and continue thereafter till a balancing stage is reached where moderate use of resources and mitigation actions for healing the hurts already inflicted, balance positively to a sustainable nature. If we do not start action now, the situation may go out of control and when our grandchildren reach adulthood; their chances of survival will be very bleak. Life expectancy of those few who survive will be much shorter than what we have now. This is something we all agree to avoid. The students who are in schools and colleges now are to be the enlightened leaders of immediate tomorrow. Our national educational authorities, as in most developed countries, therefore insist that every student in our country should learn how damages to the environment occur and how to avoid such situations, emphasizing more on possible remedial measures. This green education should start from schools and colleges, and the insistence on Green Audit of higher education institutions on an annual basis is to make students and staff well informed of the extent of ecological footprints each one creates, as well as on which areas one should concentrate to make his or her environs greener than before.

INTRODUCTION

The rapid environmental degradation at local, regional and global level is leading us to global "Environmental poverty". Stabilization of human population, adoption of environmentally sound and sustainable technologies, reforestation and ecological restoration are crucial elements in creating an equitable and sustainable future for all humans in harmony with nature and natural resources. The main objective to carry out green audit is to check green practices followed by university and to conduct a well formulated audit report to understand where we stand on a scale of environmental soundness. Green audit is the procedure of systematically identifying, quantifying, recordings, reporting and analyzing the environmental diversity components of any organization. It aims to analyze the environmental practices inside and outside of the relevant place, which will have an impact on the environment. Focus was given to assess the consumption of energy, electricity, water as well as disposal of liquid waste, solid waste, hazardous waste, e-waste and an inventory of trees on campus is also prepared to check how much CO2 is sequestered and O2 is released. It is also helpful in calculating Eco2and carbon offsetting It is an important tool for universities to determine their consumption of energy, water, or other resources; and then consider and planned to implement changes and make savings and helps to attain zero carbon approach. It can create health awareness and promote environmental awareness and ethics. It allows faculty, students and other staff to better understand the impacts of green activities on the premises. Self-inquiry is a natural and expected development of quality education. Therefore, the institute must evaluate its contribution towards a sustainable future. An environmental sustainability has become an increasingly crucial issue for every nation; the role of higher education institutions in environmental sustainability has become more important. The rapid urbanization and economic development at the regional and global levels have led to several environmental and ecological problems. In this context, it is necessary to adopt a green campus system for the institute, which will lead to sustainable development while reducing the large amount of atmospheric carbon emissions in the environment. Government of India through its National Environment Policy (2006) has made mandatory for every organization to have green audit in their organization. The process of environmental audit was formalized by Supreme Audit Institution (SAI) according to the guidelines given in Manual of Standard Orders (MSO) issued by Authority of the Controller and Auditor General of India 2002. University Grants Commission has mentioned "Green Campus, Clean Campus" mission mandatory for all higher educational institutes. As environmental sustainability is becoming an increasingly important issue for the

nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. Accordingly, realizing the need of being responsible towards environment, NAAC (National Assessment and Accreditation Council), an autonomous body under UGC has also added the concept of Environmental Audit in accreditation methodologies of State and Central Universities as well as colleges. Accordingly, Derabis College has also initiated a Green Audit of its campus.

ABOUT THE COLLEGE

Each and every institution has its own history. The history of Derabis College dates back to the year 1981 when some enlightened minds of this locality thought about the setting up a college in such a remote and underdeveloped area like Derabis with a mission and vision of providing a sphere of higher education. Their idea of establishing a centre of higher education has been a magical spirit for the then enterprising locals. Because, despite the mushrooming growth of a number of M.E. Schools and high Schools this area was once lacking Higher Education facility. This was the real problem that hovered over the heads of many a gentleman, educationist, organizer, social worker and freedom fighter of this locality. For the fulfillment of their longcherished dream a public meeting was convened at Derabish High School under the chairmanship of Sri Sadananda Bedanta, a patron of Higher Education for the purpose of opening of a college in order to cater the Higher Educational needs of the local people and the conception of Derabis College took place in that meeting.

Among the noted few blessed souls like Sri Surendranath Das, the then Headmaster of Derabish High School, Er.Banambar Das, Sri Lokanth Singh, Sri Ramachandra Ramanuja Das, Sri Duryodhan Swain, Sri Dharanidhar Ojha, Sri Nrusingha Charan Behera, Sri Ramesh Chandra Kar, Sri Batakrushna Pradhan, Sri Kulamani Rout, Ex-M.L.A and many other eminent persons from various walks of life made significant contributions towards this befitting abode acquisition of knowledge by sincerely devoting their valuable time, energy and spirit. They formed a college committee with view to raising funds with collections from the local people. The enthusiastic Sri Lokanath Singh at the initial stage donated a long-thatched house near the Derabish market for opening of this College. Being over motived. The Managing Trust Board of Lord Dadhi baban jew provided an area of Ac.7.50 decimal adjacent to the long-thatched house for the establishment of this College at Derabish. In order to make this College stand on such area Sri Duryodhan Swain, the educationist and managing trustee along with other members of the board had taken much pain of getting the land transferred from the Endowment.

After all, the whole hearted contribution of the local people cannot be undermined for the development of this tiny institution.

Location of the College is quite convenient. Situated at the heart of Derabish, it is 03Kms away from Chhata Chhak on NH-5(A), 07Kms from Cuttack, Chandabali Road, 70Kms from Cuttack via Chandikhol and 55Kms from Cuttack via Salepur.

The efforts of the management are still underway for its further of the management is still underway for its further development and for the opening of new streams and subjects.

It was a glorious moment for this locality when the state Govt. of Odisha released Grant-InAid in favour of the College and the U.G.C included the College into the list of 2(f) and 12B of the U.G.C.Acts.

VISION:

* To discover the hidden talents and the skills of the rural youths and promote them to meet the Contemporary challenges of life.
* To impart qualitative higher education to the underprivileged rural local youths with affordable cost and make them easy access for job Opportunities.
* To cultivate leadership quality and to create individual identity.

MISSION:

* To make the rural youths to compete themselves globally and to empower them through higher Education.

*To make the students skilled for their self-improvement and enable them to be self-reliant *To provide a platform to serve themselves and to serve the society.

*To create the opportunities for research and innovation, creative expression and technological advancement.

*To impart ethical values, integrity and a sense of social responsibility.

OBJECTIVES

- to understand the awareness of employees and learners towards environmental conservation
- to recognize the initiative taken by organization towards environmental conservation

- to study waste minimization and safe disposal of waste particularly hazardous wastes
- initiatives for water and energy conservation
- to diagnose and find out solutions for the environmental problems
- to facilitate the stakeholders with different aspects of mitigation of environmental management

METHODOLOGY

An environmental audit has three phases - pre-audit stage, audit stage and post-audit stage, accordingly the environmental audit was conducted.

PRE-AUDIT STAGE (Capacity building and Logistics support) Pre audit stage requires capacity building at university (which includes the participation of students and staff of various departments) and logistics supports for carry out the green audit report. Pre-audit stage involved the identification of target areas for environmental auditing. Accordingly following target areas were identified

- Land Use System
- Biodiversity Status
- Energy consumption
- eCO2 emission
- Carbon footprint
- Environmental Awareness
- Mitigation and Management practices

AUDIT STAGE

Collection of data, observation and interaction: This stage of the Audit involved the activities relating to collection of data, observation, interactions and discussion with the concerned stakeholders i.e., faculty, administration and staff members from different departments and sections of the university. A mixture of open ended and closed ended questionnaires were developed and used for data collection. Meetings with specific stakeholders of different target groups identified in the pre-audit stage were conducted for getting the desired information.

Detailed discussions on some specific topics were also held

Questionnaire for Green Audit

1. How many vehicles in total are used by the employees and students and/or residents of your department/office/establishment? Please mention how many of them are BS VI vehicle,E-vehicles, mechanical bicycles and CNG vehicles?

Type of vehicle	**Count in Numbers**
BS VI Vehicles	
E-VEHICLES	
CNG Vehicle	
Mechanical Bicycles	
Heavy Vehicles and Others	
Total	

2. How many heavy consumption machines or equipment are there in your Department/Office/Establishment? *Please provide information about its capacity (W) and average usage per month*.

Name	**Total Number**	**Energy Consumption (W)**	**Usage per day (hrs)**
1.			
2.			
3.			
4.			

3. What is the number of energy efficient electronic gadgets/items (5star or LED or Low voltage machines etc.) present in your department/office/establishment?What is their consumption capacity?

   prepare a list if possible.

Name of Electrical equipment/gadget/item	**Total in number**	**Consumption Capacity (W)**	**No of Energy Efficient/LEDs/5 Star rated Electrical Units**
1.Lightening bulb/bars etc.			
2.Fan (ceiling/ pedestial/ exhaust)			
3.Air Conditioner			
4.Refrigerator			
5. TV			
6. Water purifier			
7. Computer			
8. Printer/Scanner			
9. Xerox Machine			
10. Any other			

4.Is there any alternate source of energy present in your department/office? (e.g.,solarpanels,Biogas,windmills etc.) (If yes,what is its installation capacity in kW h or Litres per day.)

5. Total amount of E-Waste produced per year? (Any step taken to reduce/manage E-Waste in your department/office/establishment, supply details)
6. How much water is consumed in your department per day? Is there any measure to conserve or save water like rainwater harvesting or any other such method?
7. Are there any steps taken for sewage treatment installed in your department/office/establishment?

LAB EQUPMENTS

Name Of the Equipments	Total Number	Energy Consumption(W)	Usage per day

Review of previous records and policies: This was carried out in order to understand the various initiatives taken by the college towards sustainable environmental conservation and amelioration. For the purpose, office registers, visitor's book, purchase registers, office communications, policy level documents of AC/ EC were also examined. Further, the published material such as prospectus, college annual reports, bulletins, and other magazines were also studied by the audit team for getting information / data on the target aspects.

Inspection of departments/sections/various sites: The audit team also visited the various departments, sections, offices and its premises in order to have an idea of various activities carried. Campus greenery and gaps were identified. Team also had a visit to play ground, canteen, library, office rooms and parking area.

The stakeholders: The stakeholders included were teaching staff from different departments, people from administration, water supply and maintenance, electricity department and ICT. The committee set up for the purpose discussed the issues related with key target areas. Questionnaires were prepared for getting information and accordingly meeting with concerned stakeholders were conducted. Data on water and energy use was collected from maintenance department.

POST-AUDIT STAGE

The Post-Audit Stage includes the production of the final report, prepare action plan to overcome the flaws and to keep a watch on the action plan.

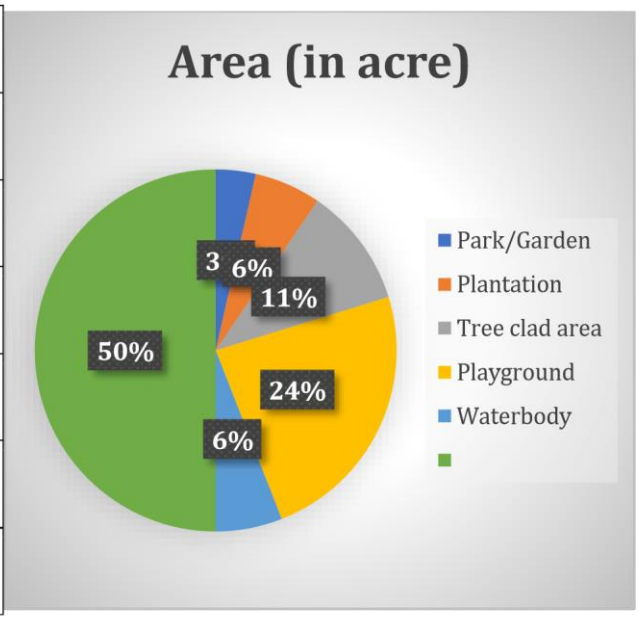
(Mention the flaws and emergency response)

COMPONENTS OF AUDIT REPORT

LAND USE AUDIT

Derabis College land use system includes Academic/ Administrative building, various departments, canteens, road, library, sports field, forest area, etc.

Land use	Area (in acre)
Park/Garden	.30
Plantation	.50
Tree clad area	.90
Playground	2.0
Waterbody	.50
	4.20



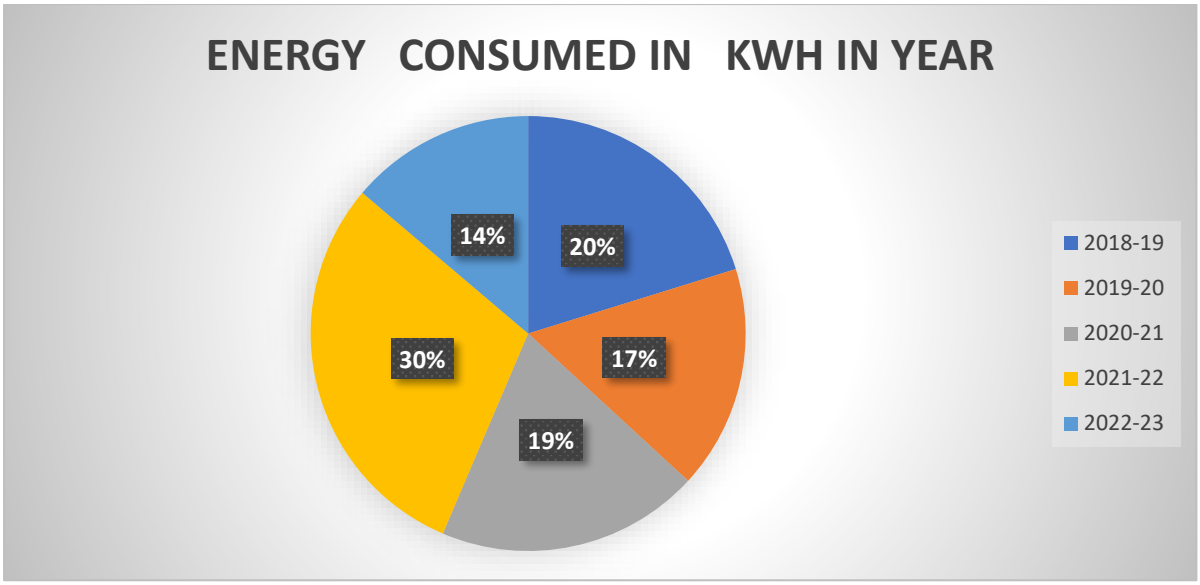
(Land use data of Derabis campus)

ENERGY AUDIT

Energy was consumed in various process and ways as energy is essential for day-to-day activities in college campus. Following ways energy was consumed in campus Electricity consumption Fuel/LPG consumption

Total Electricity Consumption (KWH) in the college campus.

SL NO	YEAR	ENERGY CONSUMED IN KWH IN YEAR
1	2018-19	40054
2	2019-20	32968
3	2020-21	38773
4	2021-22	59013
5	2022-23	27351
6	Total	198159



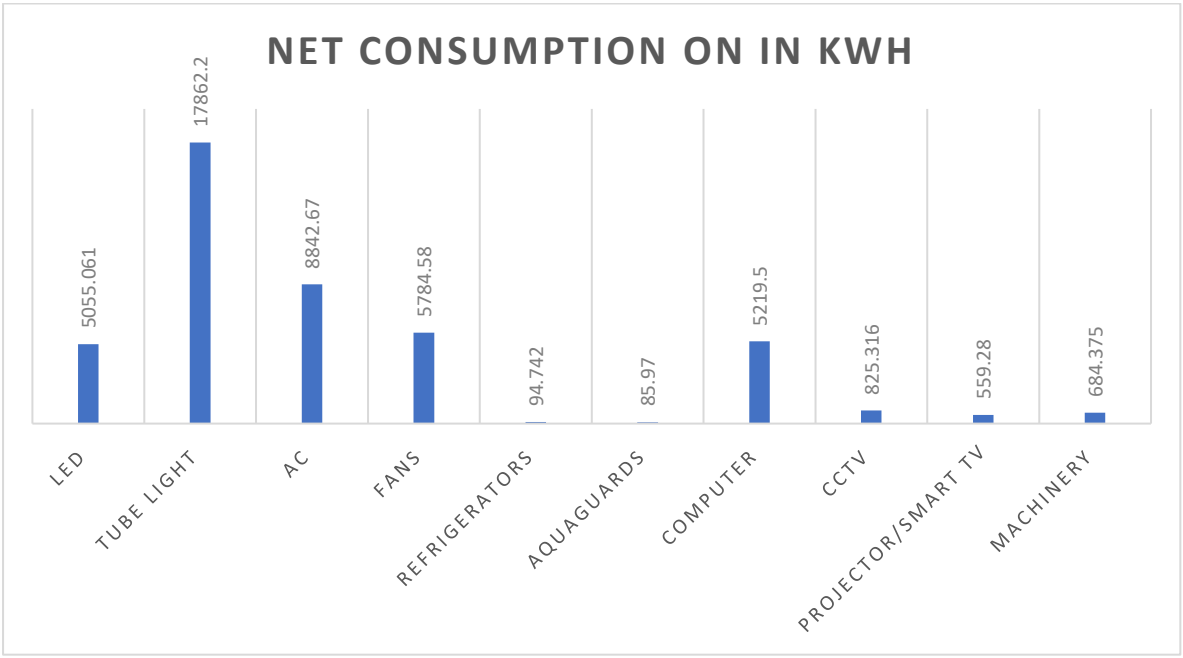
(Energy consumed data of Derabis campus)

Electricity Consumption Pattern by Department

Electricity is mainly needed for lighting the rooms, cooling the rooms in summer and running computer systems.

Total College complex wise Electricity Consumption (KWH) in the college campus.

Particulars	No of items	Total consumption in WH	Total consumption in WH per annum	Net consumption on in KWH
LED	147	18517	5055061	5055.061
TUBE LIGHT	101	65429	17862200	17862.200
AC	6	32390	8842673	8842.67
FANS	157	21188	578452	5784.58
REFRIGERATORS	1	347	94742	94.742
AQUAGUARDS	7	314	85970	85.97
COMPUTER	22	14300	5219500	5219.5
CCTV	49	3023	825316	825.316
PROJECTOR/Smart TV	10	3804.62	559280	559.28
MACHINERY	3	625	684375	684.375



(Electricity consumption by gadgets installed in different places of Derabis College)

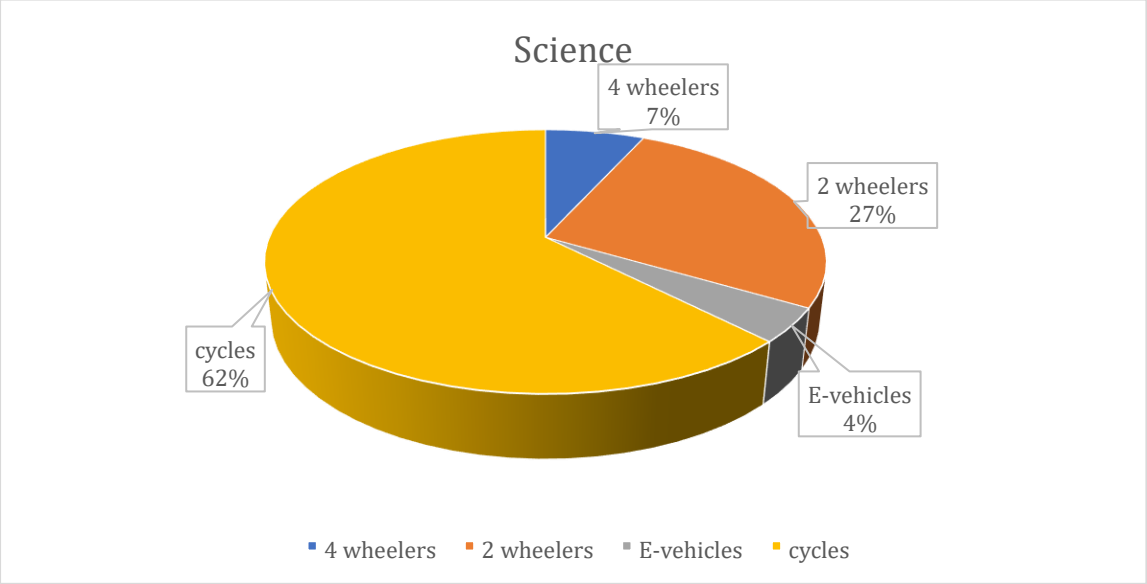
RENEWABLE ENERGY AUDIT

India is on a path to rapid energy transition, started at a normal pace in 2008 as part of the then announced Climate Change Action Plan for India, with a target of installing20,000 MW of renewable energy generation facilities including Solar and Wind electricity by 2022. Prime Minister Narendra Modi, after taking over reviewed this target and called upon the people of India to target 175,000 MW of renewable by 2022 –composed of 100,000 MW of Solar PV; 60,000 MW of Wind Power; 10,000 MW of Biomass based power and 5,000 MW of Small Hydro Power and all other renewable energy routes. At the historic 21st UNFCCC (UN Framework Convention on Climate Change) held in Paris in December 2015; India declared its INDC (Intended Nationally Determined Contribution) in which these targets are also explicitly stated. Therefore, it is only natural that through a Green Audit, any Higher Education Institution should identify opportunities for developing Renewable Energy (RE) Sources within its own premises.

Transportation Report

Vehicle plays vital role in transportation and communication in the college. There are 4 types of vehicles such as four wheelers, two wheelers, E-vehicles and cycles.

Total no of vehicles in a year				
Stream	4 wheelers	2 wheelers	E-vehicles	cycles
Science	57	223	35	523
Arts	69	250	49	678
Total	126	473	84	1201



(Transportation sector data of Derabis campus)

Derabis College has identified the following renewable energy development options for the campus:

SOLAR ENERGY

Undoubtedly, the sun is a powerful energy source, and even though we are not able but to collect a fraction of this energy, yet harnessing this power by installing solar panels can make a significant difference to the planet. While it has been widely criticized for being expensive or inefficient, solar energy has now proved to be extremely beneficial - not only for the environment but also for the private economy.

The installed capacity of solar panels in the Derabis College campus is quite good and it contributes a significant quantity of energy need of the college. Apart from the maintenance challenges, the capacity building of the photovoltaic installation in the future may improve the carbon footprint of the campus.

BIODIVERSITY AUDIT

The campus of the College is located at sub-tropical climatic conditions. The campus has a patch of natural forest having a major tree species like *Cocos nucifera, Musa paradisiaca, Psidium guajava.* Plantation activities are usually undertaken during rainy season and National Festivals like 15th August, World Environment Day etc. Some herbs and shrubs were also planted in the campus.

Flora diversity of Derabis College campus

Tabernaemontana divaricata

Cucurbita pepo

Musa paradisiaca

Cocos nucifera

Araucaria heterophylla

Peltophorum pterocarpum

Psidium guajava

Neolamarckia cadamba

Thuja occidentalis

Mangifera indica

Coccinia indica

Azadiracta indica

Datura stramonium

Mimusops elengi

Polyalthiya longifolia

Catharanthus roseus

Aloe vera

Codiaeum variegatum

Cyperus

Ficus bengalensis

Table: Flora diversity of Derabis College.

Sl. No	Common name	Scientific name
1	Mango	*Mangifera indica*
2	Neem	*Azadiracta indica*
3	Cadamba	Neolamarckia cadamba
4	Bada Chakhunda	Cassia siamea
5	Sana Chakhunda	Samanea saman
6	Krushnachuda	Delonix regia
7	Radhachuda	Peltophorum ferugineum
8	Bara	Ficus bengalensis
9	Debadaru	Polyalthiya longifolia
10	Barakoli	Ziziphus Mauritania
11	Pipali	Ficus religiosa
12	Jamun	Syzygium cumini
13	Coconut	Cocos nucifera
14	Gauva	Psidium guajava
15	Pine	Araucaria heterophylla
16	Arborvitae	Thuja occidentalis
17	Tagara	*Tabernaemontana divaricate*
18	Pumpkin	*Cucurbita pepo*
19	Banana Tree	*Musa paradisiaca*
20	Ashoka	*Peltophorum pterocarpum*
21	Ivy Gourd	*Coccinia indica*
22	Dhatura	*Datura stramonium*
23	Bana Tulasi	*Perilla ocmoides*
24	Bisalyakarani	*Tridexpro cumbens*
25	Sabai grass	*Eulaliopsis binta*

26	Croton plant	*Codiaeum variegatum*

Animals and Birds in College Campus

Monkey, Mongoose, Squirrel, Rat, Mole, Wild Cat, Dog, Indian Crow, Peigon, White Crane, Green Parrot, Cuckoo are other mammals and birds of the area.

Fig: A few species in the College Campus

Snail

Dragon fly

Honey bee

Bug

Caterpillar

Butterfly

Crab

Tadpole

Pila

Frog

Julus

Spider

ENVIRONMENTAL AWARENESS

Derabis College conducts plantation drives, cycle rallies in the campus during Environment Day, 5 June and during other important events in the college. An environmental committee also created at college level for environmental conservation dealing other environmental issues. The college staff is aware of the various environmental issues and the various green measures to be adopted in office as well as in their houses.

Theme based World Environment Day observed in campus every year to create environmental awareness

MITIGATION AND MANAGEMENT PRACTICES

At present following practices for environmental protection are also being adopted by the college:

Plantation Drives: Plantation drives are regular activities in the campus, and usually in all important occasions, plantation activity is taken up. College has maintained a garden in which different ornamental plants have been raised.

Energy Conservation efforts: College is using star rated Electrical & Electronics equipment which saves energy. LED Bulbs/ Tube-light, 4-5 star Rated Air Conditioners. College has always been effortful in making use of renewable energy resources.

Water Conservation Measures through Water Harvesting Tank: Globally, our water resources are depleting each year. Additionally, we cannot generate artificial water and must depend on water sources available on our planet earth. In this context, to reduce dependency of water from tube-well and also to recharge underground water resources, the college adopted one of the simplest and best measures for conserving water. The college had a harvesting pond in the back side of the campus. It is a simple strategy by which rainfall is stored for future usage. The collected rainwater from surfaces on which rain falls may be filtered, stored and utilized in different ways or directly used for recharge purposes. The use of a rainwater harvesting system provides excellent merits. This simple water conservation method can be a boost to an incredible solution for water conservation in the campus. It provides the most sustainable and efficient means of water management.

SWOT ANALYSIS

SWOT, the four-letter acronym for the four parameters that this analysis examines, is very common in management studies to identify strengths, weaknesses, opportunities, and threats related to project planning or running an initiative like a business, industry or campaign. Strengths and Weakness are actually internal traits of the institution or the person, and Opportunities and Threats arise from the external environment. And, all these influence the intended activity.

Strengths are aspects of the initiative that will give it some positive advantages

Weaknesses are factors that will adversely affect progress of the project

Opportunities are the exploitable windows helpful for the success of the initiative

Threats are elements in the environment that could cause trouble for the project

SWOT approach was introduced originally at the Stanford Research Institute, USA, during the 1960s. For community work and educational activities, it can be useful as a tool to identify positive and negative factors within the organization that will promote or inhibit successful implementation of social services and social change activities. The SWOT analysis for any activity, however, is only an initial part of the planning process and is not a tool that will give

a final solution. Here, the objective is to find out the shortest route for bringing down the carbon footprint of the education institution, and for making it possible to be a “net positive” green campus.

Strengths and **W**eaknesses (These are internal - within the organization– factors) Human resources: Staff, students, volunteers, PTA, nearby NGOs, public Physical resources: One’s location, land, building, equipment

Financial: Grants, funding agencies, other sources of income

Activities and processes: Green Protocol, programs run, services being rendered

Past experiences: Learning tools, reputation of the College in the community

Opportunities and **T**hreats (These are external – group/community/societal – factors)

Future trends: What is in the horizon and awaited shortly

The economy: Own, local, national, or other

Funding sources: Own, donors, governments, subsidies and incentives

Demographics: Change of players like students & staff joining and leaving Physical environment: Location sensitivities, political support, public opinion

Legislation: Change in government policies, regulatory controls, rules that can either support or destroy the initiative.

GREEN AUDIT TEAM

Internal member

Teachers

1. Dr Debabrata Nayak,Reader in Botany (convener)
2. Aswini kumar Prusty Reader in Physics
3. Bikram Kumar Mohanty, Reader in Chemistry

Student Volunteers

1. DHARITRI JENA

2. BARSARANI MALIK

3. SWAPNESWAR NATH

4. LAVASMITA SAHOO

5. MANAS BEHERA

6. RAJALAXMI SINGH

7. ASUTOSH ROUT

8. SUBHASHREE SURYASMITA DAS

External member

1. Prasanta kumar Das Reader in Botany, Aul College