

ENVIRONMENT AUDIT REPORT
(2019-2020)



U. N. (AUTO) COLLEGE
OF
SCIENCE AND TECHNOLOGY
ADASPUR, CUTTACK-754011

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ACKNOWLEDGEMENT

Udayanath Autonomous College of science and technology (hereinafter called UNC) has been working at the forefront since its inception by conducting environmental campaigns, workshops and other extension activities to bring about social change for national and international development. It is well aware about the needs of the green audit for the maintenance and future development of the campus. In its pursuit of excellence, UNC has recognized itself to improve the environmental quality and maintain its unique pristine ecosystem for the future generation of students and all the inhabitants of the campus. Although we have been taking a number of steps to conserve and protect our environment but this report is the first formal effort to document the results of our investigation and interpret the information of all the required parameters of the Environment audit process. UNC aims to take up the policy and efforts at every level to avert ecological catastrophe on a global scale by supporting the climate neutrality goals committed by the Government of India. As a part of this, efforts are taken to continuously monitor the sustainability of the academic process by constituting this Green Audit Committee consisting of faculty members working in this arena to collect basic data of the environmental parameters within the campus so that the environmental issues are resolved within the campus. The Green Audit Committee has tried to identify the current / emerging environmental issues so as to monitor the environmental management practices adopted in the campus along with subsequent impact of these on its environment. This report is an outcome of efforts of each and every member of the Environment Audit Committee who undertook this audit to gather information on every parameters of the environment, compiled and analyzed the data to recognize the immediate and serious threats within the campus so that opportunities can be explored to bring about continuous improvement in our environmental performance and standards by our suggestions and recommendations put forth. It is hoped that this report will receive adequate attention of all the stake holders for pursuing a bottom-up approach in which we stand to face the challenges in future.

The sincere encouragement and administrative support of **Prof. Daityari Singh** Principal of U. N. (Auto.) College of Science and Technology during the conduct of the study has been a

guiding force and we, the Environment Audit Committee express our heartfelt gratitude to him for his kind gesture.

Special thanks are due to **Prof. Santilata Sahoo** for her tremendous support in Floral Diversity; **Prof. Daityari Singh** for providing primary data on Environmental Audit; **Prof. Krupasindhu Pradhan**, Coordinator, IQAC for providing support to conduct the various assessment.

We are indebted to all the HODs, Teachers, officers, all staff members and all the campus dwellers of this Institute for their kind support in collecting data for the report.

We sincerely hope and believe that the untiring efforts in compiling the reports by the present Environment Audit Committee will be helpful for this Institute and it becomes a responsibility of all the stakeholders of this campus to follow the proposed management plan suggested in the report to reduce its impact on our environment.

Environmental Audit Team

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EXECUTIVE SUMMARY

An environmental audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance.

This audit report contains observations and recommendations for improvement of environmental consciousness.

Udayanath Autonomous College of science and technology, Adaspur, a premium educational institution of Odisha, started as a college exclusively dealing with various fields of the arts stream in its own building at Prachi Jnanapitha on 1991. Soon after that, to manifest the cherished dreams of all the people working hard for the noble cause of providing higher education and entrusting their hopes and faith on the institute, UNC managed to introduce the other two streams of science (1992) & commerce (1993), making the institute a full-fledged hub of knowledge and learning Honours teaching facilities were introduced in Economics, Political Science, History, Odia, Physics, Chemistry, Mathematics, Botany and Zoology in 1996; Accounting and Management in 2002; English and Education in 2003; Psychology and Sanskrit in 2004; Philosophy in 2005; Library Science and Computer Science in 2007. UNC flaunts itself as the only college in the entire state to have a teaching department in the field of Women Studies since 2010, which makes it have a grand total of 26 honours subjects (Arts- 14, Science- 8 and Commerce). To Commensurate with this vertical academic growth, the college was accorded Autonomous status in 2009 and was accredited by NAAC with B+ Grade. The college made tremendous strides with the opening of P.G classes in the subject of Mathematics, Political Science, Economic and Clinical Psychology from the session 2017-18. Now, the college holds its head high as one of the highest ranking institutions of Odisha offering P.G. courses in 20 subjects. In its long journey of 33 years the college has left indelible marks on the stand of time by producing brilliant luminaries in different fields like science, technology, sports, social service, administration and politics.

CHAPTER 1

INTRODUCTION

Environment Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of institute. It aims to analyse environmental practices within and outside of the concerned place, which will have an impact on the eco-friendly atmosphere. Environment audit is a valuable means for a college to determine how and where they are using the most energy or water or other resources; the college can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. 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.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric CO₂ from the environment. The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through carbon footprint reduction measures.

1.1. ABOUT THE COLLEGE



Nestled in the lap of Eastern Odisha, the Udayanath Autonomous College of Science & Technology, at- Prachi jnanapitha, Po- Adaspur, Dist- Cuttack has taken long strides to reach its destination- a holistic approach to life through meaningful education. The crest of the college truly symbolizes the mission & goals of the institution. The logo of the college is a magnificent blend of the heritage magnified by modernity & technological progress. The charming college emblem comprises five distinct symbols such as: sacred flame, the open book, the river, the greenery & the installed factory. The sacred flame symbolizes the light of knowledge or Jnanaloka fostered by the institution. The open book symbolizes dissemination of knowledge. The holy Prachi river stands for gravity, transparency, solidarity & sanskruti or culture. Also suggests unending flow of knowledge. The greenery symbolizes the agricultural development which is essential for overall development of the country. The installed factory suggests advanced technology & scientific development leading to industrial promotion & generation of employment.

Lastly the sacred line in Devanagari Script “तमसो मा ज्योतिर्गमय” appearing in the box at the base of the crest reveals the Motto of the institution, “Lead Me from Darkness to Light” & glorifies the Jnanapitha. The architectural design & the artistic revelations on the box add beauty carrying the impression of a holistic approach towards education.

Under the dynamic leadership of Sj. Trilochan Kanungo, former Member of Parliament (LS), educationist & social thinker & the generous, Nobel financial contribution made by the Late Udayanath Sahoo of the locality, the college managed to weather the difficulties. Named after the patron as Udayanath College of Science & Technology, the college was transferred to its own building at Prachi Jnanapitha on 3 December 1986. The other two streams of science & commerce at the H.S. level were introduced & all the three streams were accorded official recognition & affiliation together in 1987. The college stands on

the holy river Prachi; close to Kenduli, the birth place of the renowned classical poet Jayadev. The establishment of U.N. College of Sc. & Tech. at Adaspur has not only added a new dimension to the aspirations of the people of the region but it has also facilitated the spread of education to every corner of the state. To fulfill the cherished dream of the people for higher education, undergraduate classes were opened in Arts in 1991; Science in 1992 & Commerce in 1993. The college has had 2NCC units- one for boys & another for girls, 4NSS units, 1Rover unit, 1Ranger unit & 2YRC units engaged in welfare schemes.

1.2. VISION AND MISSION OF THE COLLEGE

VISION

- To become a leading institution of higher education dedicated to addressing the educational requirements of rural youth, thereby improving their quality of life. Our aim is to cultivate an environment that fosters the growth of innovative ideas and encourages the adoption of best practices in teaching, learning, research, as well as in extension and outreach endeavors.

MISSION

- To provide meaningful education, environment, opportunities & experiences that enable, more particularly, rural students to grow & prosper in their life & career.
- To develop Scientific Temper & Critical Thinking with the inculcation of values of discipline, hard work & team spirit.

1.3.ACADEMIC PROGRAMMS

Number of students admitted (year-wise) during the year:

Name of the Programme	YEAR	Number
UG		
Bachelor in Arts	2019-2020	304
Bachelor in Commerce	2019-2020	165
Bachelor in Science	2019-2020	PCM-320
	2019-2020	CBZ-178
BBA	2019-2020	27
BCA	2019-2020	30
B.SC. ITM	2019-2020	30
Computer Science	2019-2020	54
B.Lib	2019-2020	15
PG		
Odia	2019-2020	63
History	2019-2020	26
English	2019-2020	32
Philosophy	2019-2020	20
Economics	2019-2020	32
Pol. Science	2019-2020	30
Psychology	2019-2020	31
Hindi	2019-2020	11
Sociology	2019-2020	28
Education	2019-2020	32
Sanskrit	2019-2020	31
Commerce	2019-2020	31
Physics	2019-2020	32
Chemistry	2019-2020	31
Mathematics	2019-2020	32
Computer Science	2019-2020	11
Botany	2019-2020	31
Zoology	2019-2020	32
MFC	2019-2020	7
MSW	2019-2020	6

Number of sanctioned seats (year-wise) during the year:

Name of the Programme	Year	Number
UG		
Bachelor in Arts	2019-2020	416
Bachelor in Commerce	2019-2020	256
Bachelor in Science	2019-2020	PCM-416
	2019-2020	CBZ-224
BBA	2019-2020	30
BCA	2019-2020	30
B.SC. ITM	2019-2020	30
Computer Science	2019-2020	64
B.Lib	2019-2020	64

PG		
Odia	2019-2020	64
History	2019-2020	32
English	2019-2020	32
Philosophy	2019-2020	32
Economics	2019-2020	32
Pol. Science	2019-2020	32
Psychology	2019-2020	32
Hindi	2019-2020	32
Sociology	2019-2020	32
Education	2019-2020	32
Sanskrit	2019-2020	32
Commerce	2019-2020	32
Physics	2019-2020	32
Chemistry	2019-2020	32
Mathematics	2019-2020	32
Computer Science	2019-2020	32
Botany	2019-2020	32
Zoology	2019-2020	32
MFC	2019-2020	30
MSW	2019-2020	30

1.4.LAND USE & LAND COVER

TABLE 1: LAND USE CATEGORIES IN UNC CAMPUS

SL. NO.	LAND USE CATEGORY	AREA (in approx. Acres)
1.	Botanical Garden	2.3
2.	Stadium (Play ground)	12
3.	Orchards	2
4.	Road	1.5
5.	Protection Wall	10000sq. ft
6.	Building Under Construction	50000 sq. ft
7.	Overhead Tank	15pcs
8.	Car Parking	280*50ft=14000sqr ft
9.	Building	15nos.

10.	Transformer	500kv
11.	Generator	125+250
12.	Security House	15*12ft,
13.	Post office	22*12ft
14.	Water Pump	1500ft depth
15.	Septic Tank	20 pcs (40*20ft)
16.	Jungle Area	2 acres
17.	Toilet	55 nos. (10ft. x 20ft.)
18.	Garden	2acre
19.	Swimming pool	21m. x 50m.

1.5.GEOGRAPHICAL LOCATION WITH CAMPUS MAP

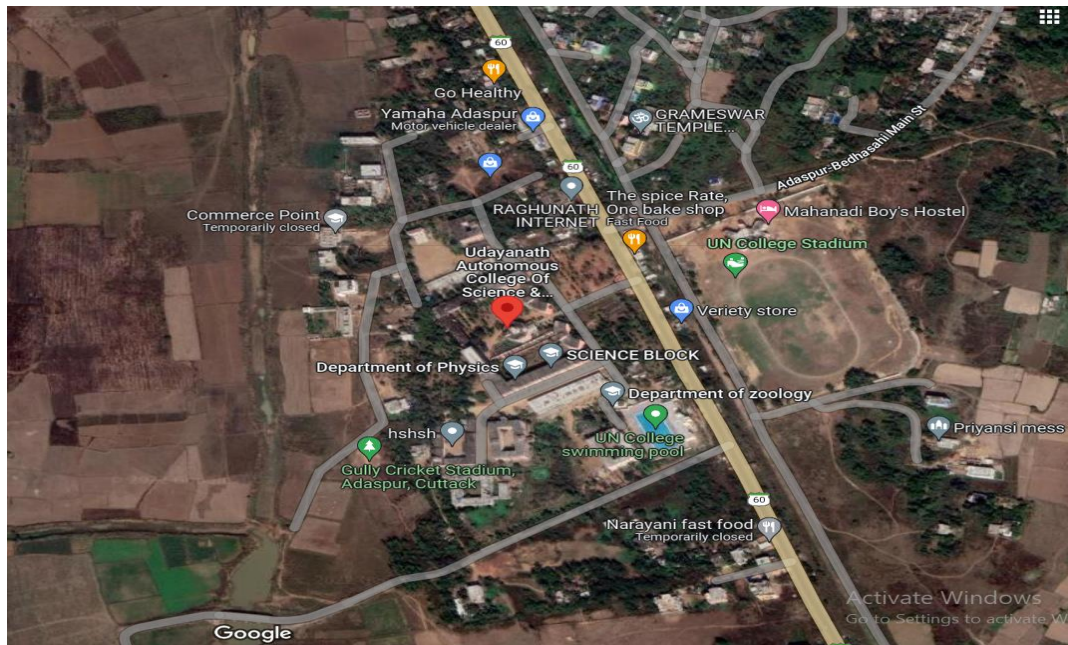


Fig 1: Location & area of the college (Source- Google maps)

The college covers an area of 30 acres of land seated at Prachi jnanapitha of Adaspur village by the side of SH-60 near the bank of holy river Prachi under Kantapada block in the district of Cuttack.

CHAPTER 2

ENVIRONMENT AUDIT

2.1. POLICY GOALS OF ENVIRONMENT AUDIT

The policy of most of the Governments world over is to have a policy which can enhance labour productivity and economic growth through accumulation of human capital. The development of the work force can largely be influenced by improving the knowledge and skills of the work force which in turn influence the future well-being of the nation with considerable gains in GDP. This has led governments to devote huge resources in improving the educational standards of its Citizens and UNC has also meticulously worked in on these lines to bring about a change. With the increasing cutting-edge research experiences in different science and technology disciplines there has been development and growth of UNC also which has led to increasing carbon footprints. The policy of the Government of India under the leadership of our Honourable PM Shri Narendra Modi Ji has also been in this direction, by declaring the mission of ‘Swachh Bharat Abhiyan’, whose voice resonates with the message of “Green Campus, Clean Campus” mission launched by the University Grants Commission for all higher educational institutes. The National Assessment and Accreditation Council (NAAC), which is an autonomous body funded by the University Grants Commission of Government of India, has made ‘Environmental Consciousness’ mandatory criterion (Criterion VII) for grading educational institutes.

At present UNC has been pursuing the policy of Sustainable development and at this juncture environment audit becomes part and parcel of management of the campus with due scope to take up academic activities within the close circles of environmental conservation and management.

Green auditing is the process of identifying and determining whether the practices taken up at UNC are eco-friendly and sustainable. It is an effective ecological tool that helps to create a culture of sustainability by implementing it through regular identification, quantification, documenting, reporting and monitoring of environmentally important components. Green auditing will thus help in preserving the rich floral and faunal diversity in and around the campus; garnering interest and creating awareness among the stakeholders in future.

UNC is committed to responsible stewardship of resources and to demonstrate leadership in sustainable academic practices. The University supports the climate neutrality goals as outlined by the Government of India and thus will monitor the sustainability of the research and education mission through the Environment Audit Committee.

- Identification and documentation of the strengths and areas of improvement within sustainable operations of administrative, academic and research laboratories via gap analysis, and outlining actions that can be implemented to further targets.
- Increase environmental awareness throughout campus and motivate all stakeholders for optimized sustainable use of available resources.
- The importance of the program is to collect baseline data of environmental parameters and resolve the environmental issue before they become a problem.

To achieve the aforementioned goals, UNC Environment Audit Committee endeavors towards the following objectives:

- To identify current and emerging environmental issues.
- To monitor environmental management practices.
- To examine the current practices that can impact the environment.
- To create awareness among the various stakeholders of the University.
- To prepare a Green Audit Report on green practices followed by different Departments, support services and administration.

2.2. BENEFITS OF ENVIRONMENT AUDIT TO EDUCATIONAL INSTITUTIONS

- It would help to protect the environment in and around the campus.
- Recognize the cost saving methods through waste minimization and energy conservation. Empower the organization to frame a better environmental performance.
- It portrays good image of institution through its clean and green campus.
- Finally, it will help to built positive impression for through green initiatives the upcoming NAAC visit.

2.3. PERFORMANCE INDICATORS FOR ENVIRONMENT AUDIT

Energy Consumption: This performance indicator measures the amount of energy consumed by the campus. It examines the energy consumption patterns, identifies areas of high energy usage, and recommends strategies for energy efficiency and conservation.

2. Waste Management: This indicator assesses how effectively the college manages its waste, including measures taken to reduce, reuse, and recycle waste materials. It evaluates waste management processes, analyzes the waste disposal methods, and suggests improvements to minimize environmental impact.

3. Water Usage: Water usage is another essential performance indicator. It tracks the college's water consumption, identifies water-intensive areas, and suggests measures to reduce water usage and promote water conservation practices.

4. Environmental Compliance: This indicator evaluates the college's adherence to environmental regulations, permits, and licenses. It examines whether the college is complying with local and national environmental regulations and recommends actions to address any non-compliance issues.

5. Greenhouse Gas Emissions: This performance indicator focuses on quantifying the college's greenhouse gas emissions. It measures the carbon footprint of the college, identifies sources of emissions, and suggests strategies to reduce emissions and combat climate change.

6. Biodiversity Conservation: This indicator assesses the college's efforts in preserving and promoting biodiversity on its campus. It evaluates measures taken to protect local flora and fauna, enhance green spaces, and introduce native species. It also recommends initiatives to raise awareness about biodiversity conservation among students and staff.

7. Transportation Management: This performance indicator examines the college's transportation practices and policies. It assesses the college's efforts to promote eco-friendly modes of transport, such as carpooling, public transportation, and cycling. It also evaluates the availability of parking spaces for electric vehicles and suggests measures to reduce reliance on fossil fuel-based transportation.

8. Education and Awareness: This indicator evaluates the college's initiatives to educate and raise awareness about environmental issues among students, staff, and the wider community. It assesses the effectiveness of environmental education programs, awareness campaigns, and sustainability-focused events organized by the college.

9. Green Building Practices: This performance indicator focuses on the college's infrastructure and building practices. It assesses whether the college follows green building principles, such as energy-efficient design, use of sustainable materials, and integration of renewable energy sources. It also suggests ways to improve the sustainability and environmental performance of existing buildings.

10. Stakeholder Engagement: This indicator evaluates the college's engagement with various stakeholders, including students, faculty, staff, local community, and government agencies. It assesses the level of collaboration, consultation, and involvement of these stakeholders in the college's environmental initiatives. It also recommends ways to enhance stakeholder engagement and facilitate partnerships for sustainable development.

2.4. METHODOLOGY FOLLOWED FOR CONDUCTING ENVIRONMENT AUDIT

The management of the Institution has shown a commitment towards environment auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly such as awareness programs on the environment, campus farming, planting more trees in the campus, etc. In order to perform environment audit, the methodology included different tools such as preparation of questionnaires, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarize the present status of environmental management in the campus:

- ❖ Energy Management
- ❖ Water Management
- ❖ Waste Management

❖ Environment Management

The audit process was carried out in three phases. At first, all the primary and secondary data required for the study was collected from various sources by concerned departments. A broad reference work was carried out to clear the idea of environment auditing. Different case studies and methodologies were taken into consideration and the following methodology was adopted for the present audit. The methodology of the present study is based on onsite visits, personal observations, door to door visit and questionnaires. Initially, based on data requirements, various sets of questionnaires were prepared. The surveyors then visited all the departments of the UNC and the questionnaires were filled. The generated data is subsequently gathered and used for further analysis. From the outcome of the overall study, a final report is prepared.

Step 1: Collection of primary data through observation, surveys, interaction and discussions

Step 2: Collection of secondary data through observation, surveys, interaction and discussions

Step 3: Conduction of comprehensive Environment Audit

Step 4: Reporting the Environment Audit

CHAPTER 3

PRE AUDIT QUESTIONNAIRES & CAMPUS ENVIRONMENT

PRE AUDIT QUESTIONNAIRES

Questionnaires were prepared to conduct the green audit in our campus based on the guidelines, rules, acts, and formats prepared by the Ministry of Environment, Forest and Climate Change (New Delhi), Central Pollution Control Board, and other statutory organizations. Most of the guidelines and formats are based on broad aspects and some of their issues and formats were not applicable for our campus. Therefore, using these guidelines and formats, combinations, modifications, and restructuring were done and sets of questionnaires were prepared for solid waste management, energy management, water management, hazardous waste and e-waste management data.

All the questionnaires were a group of modules. The first module was related to the general information of the concerned department, which broadly includes the name of the department, month and year, the total number of students and employees, visitors of the department, average working days and office timings, etc. The next module was related to the present consumption of resources like water and energy, or the handling of solid and hazardous waste. Maintaining records of the handling of solid and hazardous waste is much important in environment audits. There are possibilities of loss of resources like water and energy due to improper maintenance, and taking precautions for this kind of probability from the beginning of the survey is necessary for an environment audit. One separate module was based on the questions related to this aspect. Another module was related to maintaining records, like records of disposal of solid waste, records of solid waste recovery, etc. For better convenience of the surveyor, some statistics like basic energy consumption characteristics for electrical equipment, etc. were provided with the questionnaires.

General questionnaires:

1. Where is the institute located?
2. What is the strength of the institute?
3. What is the total area of the campus?
4. Does the institute have
 - a. Playground
 - b. Library
 - c. Laboratory
 - d. Toilet
 - e. Garden area
 - f. Canteen
 - g. Hostel
 - h. Staff quarters
 - i. Garbage or waste store yard
5. Does the institute have the following nearby
 - a. Dispensary
 - b. Municipal dump yard
 - c. Open drainage
 - d. Industry
 - e. Sewer line
 - f. Public convenience
 - g. Railway station
6. Does the institute conduct an environment audit of the campus?
7. Climate & topography of the institute
8. Soil analysis report

Questionnaires on water storage, consumption and conservation:

1. What are the water sources to the institute?
2. What is the water storage system in the institute?
3. What are the ways in which water is consumed in the institute?
4. What are the number of bathrooms in academic, administrative and hostel buildings?
5. Does the institute have any rainwater harvesting system?
6. Does the institute follow any special method for safe disposal of water released from the laboratory?
7. What are the techniques used to save water by the institute?

Questionnaire on energy consumption and conservation:

1. How many CFL/LED bulbs are used in the institute?
2. What is the source of energy in the institute?
3. Does the institute follow any energy saving techniques?
4. What are the various forms in which energy is used in the institute ?
5. How many air conditioners are installed in the institute?
6. Does the institute run on DG as an alternative to electricity?
7. Do people of the institute ensure to completely turn off electronic devices such as PCs and ACs?
8. Are electronic devices such as PCs and ACs run on power saving mode?

Questionnaires on solid waste generated and its management

1. What are the sources and types of waste generated in the institute?
2. How much waste per day is generated in the campus approximately?
3. Is there any adoption of waste treatment system?
4. How can the institute achieve a state of zero garbage?
5. Are the domestic and agricultural waste converted to compost?

Questionnaire on greenery of the campus:

1. Does the campus have a garden?
2. What is the total number of tree, herb and shrub species in the campus?
3. Name the different type of plants in the institute
4. Is there an active involvement of students in the management of the garden?

Questionnaire on air quality of the campus:

1. What is the approximate size of a classroom and how many windows are present in each classroom?
2. What is the approximate number of vehicles owned by
 - a. Staffs
 - b. Students
3. Is proper ventilation of every floor ensured by the institute?
4. Are there any cases of respiratory ailments among students of the institute?
5. What are the steps taken by the institute to improve overall air quality of the campus?

Questionnaire on biodiversity of the institute:

1. Has the institute accurately recorded accounts of every plant species found in the campus?
2. Does the institute conduct any kind of biodiversity awareness programs?

Questionnaire on environment legislative compliance

1. Does the institute regularly monitor the quality of water supplied to the campus?
2. Does the institute release any kind of hazardous waste? If yes, what are their plans for safe disposal/ treatment of such waste produced?
3. Is there proper propagation of necessary pre-required knowledge of environmental laws and innovative methods of managing waste produced among the students?
4. What are the steps taken by the management /governing body against people who pollute the environment or violate environmental laws of the institute?

Answers to questionnaires and the campus environment

1. Where is the institute located?

The college covers an area of 30 acres of land. It is seated at Prachijnanapitha of Adaspur village, by the side of SH-60 and near the bank of holy river Prachi under Kantapada block in the district of Cuttack. It is located precisely at north latitude 20.213059° & east longitude 86.014549°. The college is situated between the twin-cities, Cuttack and Bhubaneswar.

2. What is the strength of the institute?

The institute provides UG courses in 26 subjects and PG courses in 20 subjects with a total strength of about 6300 students.

3. What is the total area of the campus?

The college covers an area of 30 acres of land. The whole college area has been divided into two main parts, stadium site & main academic- administration site.

4. Does the institute have the following?

SERIAL NO.	AREA	AVAILABLE	DETAILS
1.	Playground	Available	<ul style="list-style-type: none"> ❖ Gymnasium ❖ Badminton court ❖ Volleyball court ❖ Kho – kho court ❖ Football ground ❖ Cricket ground
2.	Library	Available	<ul style="list-style-type: none"> ❖ Central library ❖ E-library ❖ Reading room
3.	Laboratory	Available	<ul style="list-style-type: none"> ❖ Botany ❖ Chemistry ❖ Comp.Sc. ❖ Clinical Psychology ❖ Geology ❖ Geography ❖ Mathematics ❖ Physics ❖ Zoology
4.	Garden area	Available	<ul style="list-style-type: none"> ❖ Flower garden ❖ Orchard 1 ❖ Botanical garden 1 ❖ Orchard 2 ❖ Botanical garden 2
5.	Toilet	Available	<ul style="list-style-type: none"> ❖ Separate toilets for male & female in academic, administrative, hostel, guest house buildings. ❖ Separate toilets are also available for physically challenged.
6.	Canteen	Available	<ul style="list-style-type: none"> ❖ An open well furnished, hygienic canteen is present.
7.	Hostel	Available	<ul style="list-style-type: none"> ❖ Mahodadhi Boys' Hostel ❖ Meghasan OBC Boys' Hostel ❖ MahaDevi Girls' Hostel ❖ Mandakini Girls' Hostel ❖ P.G. Women's' Hostel
8.	Staff quarters	Available	
9.	Garbage or waste store yard	Available	<ul style="list-style-type: none"> ❖ Portable dustbins are placed for waste deposition.

5. Does the institute have the following nearby?

SERIAL NO.	AREAS	REMARKS
1.	Dispensary	❖ Adaspur PHC is available at a distance of 1.3 K.M.
2.	Municipal Dump Yard	❖ Not available
3.	Open drainage	❖ Not available
4.	Industry	❖ Not available
5.	Sewer line	❖ Not available
6.	Public convenience	❖ Available
7.	Railway station	❖ Both the twin- city railway stations are available at a distance of 30 K.M.
8.	Airport	❖ Biju Pattnaik International Airport is available at a distance of 27 K.M.

6. Does the institute conduct an environment audit of the campus?

Yes, the institute conducts annual environment audit report every year.

7. Climate & topography of the institute

Climate & Meteorology

UNC is located in the coastal region of Odisha, about 50 km west from the Bay of Bengal. Due to its location, the climatic conditions remain tropically humid. The campus experiences all six seasons but generally, only three seasons are noticeably appreciated. The monsoon season generally starts here in the months between June and October. Winter starts from mid November to February, followed by a hot & humid summer from mid- March to mid- June.

Rainfall

Due to such tropical, humid climate, UNC receives an amount of about 100-115 cm of rainfall during the South-West Monsoon (Mid June to September), which contributes about 80% of annual rainfall. South- west Monsoon generally reaches Cuttack by mid- June (2nd week of June) and prevails up to the end of September or 1st week of October. During this period, the place experiences more than 50% of the rainy days from the total monsoon period. Another factor of rainfall is the Nor'wester, which takes place during the hot-humid summer (March- June). It

comes with a heavy thunderstorm along with heavy, localized rainfall which makes 5 % of the annual irregular rainfall.

Wind

During winter season (December- February) surface winds in the Campus are light and variable. However during March to August strong (8 to 30 km/h) South Western wind prevails (Nor'wester). During September to November winds are relatively light & variable.

Temperature

Hot weather prevails over the campus during March to May. May is the hottest month with average maximum temperature around 30-35°C. Long term analysis of average maximum temperature during the summer shows marginal rising of temperature. The greenery of the campus protects and controls the rising temperature during the heavy heat wave. The temperature of the campus remains in a control condition during summer in comparison to the heavy temperature of the Twin-city. Relatively winter is not that severe due to proximity to the sea. Due to the greenery the temperature remains slightly cool than the twin-city. During December to February the average minimum temperature varies in between 10- 12°C. During the end of December the average minimum temperature gets down up to the 10°C.

Topography

Topographically UNC campus belongs to the East & south-eastern coastal plain Agro-climatic zone. The soil type is deltaic alluvial & laterite. The altitude of this place is nearly 17 meters (55.77 ft) above the sea level.

Geology

Geologically, Cuttack & it's adjacent areas comes under the Gondwana landmass, one of the oldest and stable landmass in the world. The campus is situated as a deltaic zone lying in between the Devi & Prachi River. The deltaic zone comprises of a very good quality of agricultural soil.

Vegetation

The Flora of UNC & it's surroundings are broadly classified as Northern Tropical Moist Deciduous (mixed) type.

The extremely severe cyclone storm "FANI" made landfall on the Odisha Coast south of puri on 3rd may, which has caused a massive damage to infrastructure of the UNC campus.

8. Soil quality assessment 2019- 2020

The soil samples were collected from the campus, placed in clean, labeled polyethylene bags and then transported to the laboratory for quality analysis after air drying under room temperature. The soil samples were ground using mortar and pestle to reduce the particle size and then sieved through a 2 mm mesh to obtain acceptable and homogeneous samples. The samples were stored at room temperature until the physicochemical analysis was performed. Various soil edaphic parameters like soil pH, electrical conductivity (EC), total organic matter (OM) as carbon content, available nitrogen, available phosphorous, potassium, calcium, magnesium and sodium were estimated.

The fundamental characteristics of soil samples are very important because soil health determines the various types of plant and microbial diversities in terms of the number of Genera and species diversity and richness. Besides, the population density as well as diversity determines the human population intervention, anthropogenic sources, municipal sewage disposal, solid / garbage waste disposal, industries activities and use of large number of vehicles and agrochemicals which will pollute the soil health. The availability of macro and micro-elements of soil determines the number of beneficial microorganisms such as nitrogen fixing, potassium solubilizing and phosphorous mobilizing microorganisms for example bacteria, fungi and actinomycetes. The soil nutrients are being considered as essential elements for enhancing the profuse growth of various plant species and microbial organisms.

Soil physic-chemical properties influence the behavior of soil and hence, knowledge of soil property is important. Soil testing is the only way to determine the available nutrient status in soil and the only way we can develop specific fertilizer recommendations. Soil properties that are sensitive to changes can be used as indicators to improve soil quality.

The fertility of the soil depends on the concentration of N, P, K, organic and inorganic materials, conductivity. The physicochemical properties such as moisture content, nitrogen, phosphorus and organic matter required for the growth of plant. Potassium is used for flowering purpose, for building of protein, photosynthesis, fruit quality and reduction of diseases and phosphate is used for growth of roots in plants. The soil profile and soil edaphic parameters of the campus

observed to be low in the essential nutrients which are needed for the plant growth. The soil fertility has to be enhanced by adapting vermi-composting and proper irrigation facility which is now well implemented in the campus.



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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report No. - CEMC/UNAC/080619/S1

Issued Date-07.06.2020

SOIL QUALITY TEST REPORT

Name & Address of the Client
Date of Sampling
Sampling by
Date of Sample Received
Sample Description
Sample Quantity
Sample Location
Date of Analysis
Reference No.

: M/s U.N AUTONOMOUS COLLEGE OF SCIENCE & TECHNOLOGY
: 01.06.2020
: Mr. B.k Samantray
: 01.06.2020
: Soil
: 1 kg
: College Garden
: 01.06.2020 to 07.06.2020
: CEMC-08062019S1

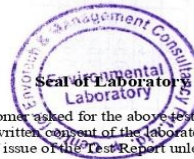
ANALYSIS RESULT

1	pH	-----	6.92
2	EC	µS/cm	298
3	Colour	-----	Grey
4	Sand	%	45.2
5	Silt	%	16.4
6	Clay	%	37.2
7	Texture	%	Sandy clay
8	Specific Gravity	-----	1.18
9	moisture	%	4.8
10	Organic matter	%	1.16
11	Nitrogen	Kg/Ha	218
12	Potassium	Kg/Ha	206
13	sodium	Kg/Ha	326
14	phosphorous	Kg/Ha	16.8
15	Calcium	Mg/kg	78.92
16	Magnesium	Mg/kg	80.2


Authorized Signatory

Notes:

- > The result given above related to the tested sample, as received. The customer asked for the above test only.
- > This Test Report shall not be reproduced wholly or in part without prior written consent of the laboratory.
- > The samples received shall be destroyed after two weeks from the date of issue of the Test Report unless specified otherwise



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E-mail: cemclab@yahoo.in, Mobile: 9937631956, 8895177314

Questionnaires on water storage, consumption and conservation:

1. What are the water sources to the institute?

The major source of water in UNC is a self-reliant water boring system installed in the campus. There are Ground Water Tube wells installed in the campus with a RCC 2HP Single Phase Submersible Motor and a 2HP 3 Phase Submersible Motor, which operate to fill the various tanks.

2. What is the water storage system in the institute?

A number of main buildings of the campus, like hostels, commerce, arts and science blocks are equipped with many RCC tanks of varying capacities to meet the specific demands of the said establishments. These tanks are enabled with fast and efficient RCC 2HP Single Phase Submersible Motors for further convenience.

Other buildings including the library building and principal quarter are supplied with water through various PVC Syntax tanks having a capacity of 1000L. And finally, the stadium building is equipped with a 2HP 3 Phase Submersible Motor.

3. What are the ways in which water is consumed in the institute?

Water is a crucial amenity and its usage in all hostels, cafeterias, academic buildings, on-campus, on-gardens, at construction sites, laboratories etc. is judicially carried out.

4. What are the number of bathrooms in academic, administrative and hostel buildings?

There are a total number of 375 bathrooms (with toilets) present in the academic, administrative & hostel buildings.

5. Does the institute have any rainwater harvesting system?

No the university have no rain water harvesting system .

6. Does the institute follow any special method for safe disposal of water released from the laboratory?

The various kinds of wastewater released from the campus include sewerage, residence (water used in cooking, showering and washing clothes) as well as chemical and biological laboratories, which ultimately go down in the sink or drainage system.

7. What are the techniques used to save water by the institute?

Several practices have been adopted to save water. Pipes, overhead tanks, and plumbing systems are maintained properly to reduce leakages and unnecessary wastages of water. The college is also planning to build a common distillation plant for all the laboratories to reduce loss of water.

Questionnaire on energy consumption and conservation:

1. How many CFL/LED bulbs are used in the institute?

There is a total of 250 nos. of CFL & 775 nos. of tube lights are used in the institute. A total no. of 25 LED Street lights are also placed in the campus.

2. What is the source of energy in the institute?

The energy source of the institute is the electricity provided by the TP Central Odisha Distribution Limited (Electricity through transformer).

3. Does the institute follow any energy saving techniques?

Yes, College adopts practices like turning off lights when not in use, using energy-efficient appliances, and optimizing computer usage by enabling power-saving settings.

4. What are the various forms in which energy is used in the institute ?

The institute mainly depends on the electrical energy provided by the govt. for use. The canteen, hostel mess uses the LPG as fuel for preparation of food.

5. How many air conditioners are installed in the institute?

There are 10 air conditioners that have been installed in the institute.

6. Does the institute run on DG as an alternative to electricity?

Yes, the institute runs on DG as an alternative source of electricity. It operates on automated programming. This remains on during power disruption only. There are 2 DG sets, installed for the academic, administrative & hostel purposes. The capacities of the DGs are 125kV & 250kV respectively.

7. Do people of the institute ensure to completely turn off electronic devices such as PCs and ACs?

The employees of the institution have been instructed to turn off all the electrical devices during leisure hours. A number of peons are appointed to monitor the usage of electrical equipments on a daily basis.

8. Are electronic devices such as PCs and ACs run on power saving mode?

Yes, all the lab equipments, PCs & ACs run on power saving mode.

Questionnaires on solid waste generated and its management

1. What are the sources and types of waste generated in the institute?

Different types of wastes, such as paper waste, plastic waste, construction waste, glass waste, etc. are released from various buildings of UNC and the same is directly handed over to the Municipalities' Bin for further segregation and recycling purposes.

2. How much waste per day is generated in the campus approximately?

Approximately, a net weight of 90 kg of waste is generated every day.

The rate of waste generated has been increasing in the recent times, reaching up to an estimated amount of about 4 tonnes per month during peak academic sessions and the minimum amount generated during the lean period is about 2 tonnes per month.

3. Is there any adoption of waste treatment system?

No, there is no adaptation of waste treatment system

4. How the institute can achieves a state of zero garbage?

Provisions for installation of a garbage unit should be introduced where the multilevel segregation of various wastes such as paper, construction, glass, metal scrap and food waste should be done. Further, various waste recycling plans for different types of waste should be introduced.

5. Are the domestic and agricultural waste converted to compost?

UNC has taken initiatives for the management of biodegradable waste by processes like dry & wet waste management and vermin-composting technology, which relies upon the conjoint action of earthworms and microorganisms to rapidly transform various types of solid wastes. Considering the simplicity and flexibility of the technology, a vermi-composting unit was established in January 2018 in the campus under the supervision of the green audit team.

Questionnaire on greenery of the campus:

1. Does the campus have a garden?

Yes, the institute has one botanical gardens, one flower garden along with two Orchards.

2. What is the total number of tree, herb and shrub species in the campus?

The total numbers of tree, herb & shrub species in the campus is about 950 with around 105species.

3. Name the different type of plants in the institute

Some of the most noticeable plants found inside the campus are *Terminalia catappa*, *Cocos nucifera*, *Dyopsis leutescens*, *Polyalthia longifolia*, *Mimusops elengi*, *Pongamia pinnata*, *Mangifera indica*, *Carica papaya* and *Azadiracta indica*, which are found in 15 observational sites inside the campus.

4. Is there an active involvement of students in the management of the garden?

Yes, the students take active role during plantation programs. They also instructed to take precautionary measures and follow proper protocols for the overall development of plants.

Questionnaire on air quality of the campus:

1. What is the approximate size of a classroom and how many windows are present in each classroom?

The approximate sizes of the classrooms are 30'* 20'ft. . In average, there are 6 windows per classroom.

2. What is the approximate number of vehicles owned by

- Staffs
- Students

a. Staffs

Not all the staffs use their own vehicles. They rather opt for public transport services. About 60% of the total staffs have their own vehicles, and many of them prefer carpooling.

b. Students

Most of the students use public transport. Approximately 40% of the students come to the institute via personal transit system & the remaining 60% use public transit systems.

3. Is proper ventilation of every floor ensured by the institute?

Yes, proper ventilation has been ensured by the institute at every floor. All the classrooms are well ventilated by natural air, as there are open windows built into every classroom.

4. Are there any cases of respiratory ailments among students of the institute?

No. Yet, there have been no cases reported regarding any respiratory ailment among students of the institute.

5. What are the steps taken by the institute to improve overall air quality of the campus?

The institute has taken all the measures to provide the best greenery to the campus environment. The main motto of the plantation program is to improve the overall air quality and make the environment ambient.

Questionnaire on biodiversity of the institute:

1. Has the institute accurately recorded accounts of every plant species found in the campus?

Yes, the institute has accurately recorded every plant species found in the campus.

2. Does the institute conduct any kind of biodiversity awareness programs?

Yes, the institute conducts many biodiversity-related awareness programs for educational purposes and spreading awareness about the value and importance of public involvement in the conservation of biodiversity. The plantation programs, in particular are managed by the NSS & YRC unit of the institute. They choose any barren land or field & do avenue plantations inside & outside of the campus.

Questionnaire on environment legislative compliance

1. Does the institute regularly monitor the quality of water supplied to the campus?

The institute monitors the quality of water supplied to the campus on an annual basis as contaminants in our water can lead to serious health issues. The water quality is monitored with respect to its suitability for various purposes such as drinking or swimming.

2. Does the institute release any kind of hazardous waste?

The institute does not produce any kind of hazardous waste. The waste produced by the institute follows the 3R rule.

3. Is there proper propagation of necessary pre-required knowledge of environmental laws and innovative methods of managing waste produced among the students?

The institute has prepared guidelines for staffs & students regarding the waste management produced from different sources.

4. What are the steps taken by the management /governing body against people who pollute the environment or violate environmental laws of the institute?

Although the institute is placed in a rural area but the local people have knowledge & respect towards the institute which protects the institute from external pollution. Common violation such as dumping hazardous wastes or improper handling of wastes, littering, destruction of wetland, burning of fossil fuels etc are strictly checked by the authority and warned if anyone is found guilty.

CHAPTER 4

WATER CONSUMPTION & MANAGEMENT

4.1 WATER

Water is a precious natural resource available with a fixed quantum. The availability of water is decreasing due to the increasing population of the nation, as per capita availability of utilized water is going down. Due to the ever-rising standard of living of people and advancements in industrialization and urbanization, demands for freshwater is increasing day by day. The unabated discharge of industrial effluents into nearby freshwater bodies is reducing the quality of these precious sources of water continuously. Hence, the national mission on water conservation, 'Jal Shakti Abhiyan' was declared by the Honorable Prime Minister, Narendra Modi as an appeal to all citizens requesting cooperation in collectively addressing the problem of water shortage by conserving every drop of water and conducting water audits for all sectors of establishment. Water audit can be defined as a qualitative and quantitative analysis of water consumption to identify means of reducing, reusing, and recycling water. Water Audit is nothing but an effective measure for minimizing losses and optimizing various uses of water and thus, enabling effective management of water in the irrigation, domestic, power, and industrial sectors. A water audit is a technique or method which makes it possible to identify ways of conserving water by determining any inefficiency in the system of water distribution. The measurement of water losses due to differences in usage and utility is essential for implementing water conservation measures in such an establishment.

4.2. SOURCE OF WATER

- Bore water

A Main source of water is Ground water, extracted to full the requirement. At present there are 3 bore wells out of which 1bore well is catering to the UNAC guest house. The college stores the water in over head tank.

SL. NO.	DESCRIPTION	LOCATION IN THE CAMPUS
1.	Borewell-1	Near commerce block
2.	Borewell-2	Garden
3.	Borewell-3	Administrative block
4.	Borewell-4	Arts block
5.	Borewell-5	Meghasan OBC Boys Hostel
6.	Borewell-6	Mahodadhi Boys Hostel
7.	Borewell-7	Mandakini Girls Hostel
8.	Borewell-8	Mahadevi Girls Hostel
9.	Borewell-9	P.G. Women's Hostel
10.	Borewell-10	Guest House
11.	Borewell-11	Stadium
12.	Borewell-12	Stadium
13.	Borewell-13	Near Vermicompost Unit
14.	Borewell-14	Swimming pool

Table 2: Borewell present in the campus



Fig.2 :Bore well in the Campus



Fig3:Bore well in the Hostel

4.3 WATER STORAGE CAPACITY IN THE CAMPUS

A number of main buildings of the campus, like hostels, and art and science blocks are equipped with many RCC tanks of varying capacities to meet the specific demands of the said establishments. These tanks are enabled with fast and efficient RCC 2HP Single Phase Submersible Motors for further convenience. Other buildings including the library building and principal quarter are supplied with water through various PVC Sintex tanks, having a capacity of 1000L. And finally, the stadium building is equipped with a 2HP 3 Phase Submersible Motor.



Overhead RCC tanks

TABLE 3: STATUS OF WATER STORAGE CAPACITY IN UNC

SL. NO.	DESCRIPTION	CAPACITY	TYPE
1.	Mahodadhi Boys Hostel	20763L	RCC
2.	Meghasan Boys Hostel	12506L	
3.	Mahadevi Ladies Hostel	21432L	
4.	Mandakini Ladies Hostel	21232L	
5.	Swimming Pool	13875L	
6.	Science Block	21057L	
7.	Arts Block	14877L	
8.	PG Ladies Hostel (2)	2000L	PVC SINTEX
9.	Auditorium	1000L	
10.	Silver Jubilee Building	1000 L	
11.	Library Building	1000 L	
12.	Administrative and IT block (2)	2000 L	
13.	Principal Quarter	1000L	
14.	Cycle Stand	1000L	
15.	Stadium Building	2000L 3000L	RCC WELL

4.4 WATER CONSUMPTION IN THE CAMPUS

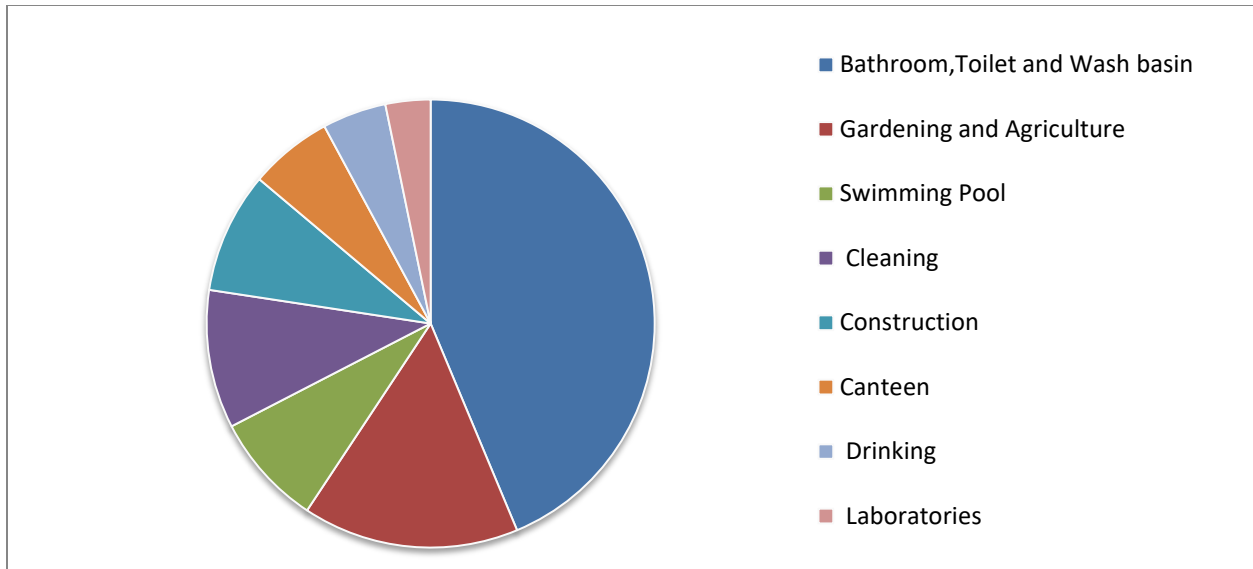
Water usage can be defined as water used for all activities which are carried out on campus from different water sources. This includes usage in all hostels, academic buildings, on-campus, on-grounds, laboratories etc.

Total water consumption of the campus is approx. 701 Kilo Litres per day by operating discharge pumps with a total discharge capacity of 130 Kilo Litres for 8 hours per day. The water is used to cover the total daily consumption in the UNC Campus including Drinking, Bathroom, Toilet, Garden, Urinals, Wash Basin, Laboratory etc. in the total population of 7,000 (Including office staff, strength and residential buildings) of the UNC campus. Hence total approx. 104.4 Litres per day per head is used for Bathroom, Toilet, Garden, Urinals, Shower, Drinking, and Laboratories etc. However, the above data varies as per the requirement on the basis of academic Calendar.

TABLE 4: STATUS OF WATER CONSUMPTION IN UNC

Sl. No.	Sector	Total Daily Use (KL)	Total Monthly Use (KL)	Total Yearly Use (KL)	Percentage
1.	Gardening and Agriculture	125	3750	45,000	16.97
2.	Bathroom, Toilet and Wash basin	350	10500	1,26,000	47.53
3.	Laboratories	26	780	9,360	3.53
4.	Canteen	48	1440	17,280	6.51
5.	Construction	70	2100	25,200	9.50
6.	Drinking	37	1110	13,320	5.02
7.	Swimming Pool	65	65	130	0.04
8.	Cleaning	80	2400	28,800	10.86
	Total	801	22,135	2,65,090	100

N.B.: The above data is obtained on the basis of maximal usage of water during peak academic period



Daily water consumption status



Fig:4 Inaugural ceremony of Swimming Pool



Fig:5 Swimming Pool of UNC

The Swimming pool was inaugurated on September 9, 2019. It's maintenance in college is a complex task, as it involves keeping the pool clean, safe, and in good condition for use by students and staff. Here are some essential aspects to consider for effective swimming pool maintenance in a college:

- ❖ **Regular cleaning:** The pool is regularly cleaned to remove debris, leaves, and other floating materials, skim the surface and vacuum the pool floor to maintain cleanliness. The pool walls are scrubbed to prevent algal growth.
- ❖ **Water balance and chemistry:** The chemical balance of the pool water is crucial to ensure it is safe and sanitary. Regularly the water for pH levels, chlorine/bromine levels, alkalinity, and calcium hardness is tested. Chemicals such as TCCA, Alum, and Soda etc are added to maintain proper balance.
- ❖ **Filter maintenance:** The pool's filtration system is responsible for removing impurities from the water. The filters are cleaned or backwashed regularly to ensure their proper functioning and effectively removing contaminants.
- ❖ **Equipment inspection:** Regularly the pool's equipments are inspected, including pumps, motors, and heaters, to ensure that they are in good working condition. Faulty components are replaced promptly to prevent further damage and to ensure uninterrupted pool operation.
- ❖ **Safety measures:** A regular inspection of safety equipment like ladders, diving boards, and lifeguard chairs is conducted.
- ❖ **Regular testing and maintenance:** The pool water is tested for bacteria regularly to ensure that it meets health and safety standards. Additionally routine maintenance tasks such as checking and cleaning drains, checking pool lights, and monitoring water level is performed.
- ❖ **Staff training:** Staffs handling the pool are trained in proper maintenance techniques, water chemistry, and safety protocols. This will help them efficiently manage the pool's maintenance needs.

2.5. WATER ANALYSIS REPORT

Water conservation is a key activity as water availability affects on the development of the campus as well as on all area of development such as farming, industries, etc. Keeping this view water conservation activity is carried out.

Water quality testing is important because it identifies contaminants and prevents waterborne diseases. Drinking or using contaminated water can result in severe illness or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease. The parameters for water quality are determined by the intended use. Work in the area of water quality tends to be focused on water that is treated for human consumption, or in the environment.

The following indicators are often measured for drinking water like Alkalinity, Color of water, pH value, Taste and odor, Dissolved metals and salts (chloride, manganese, magnesium etc.), Dissolved metals and metalloids (lead, mercury, arsenic, etc.), Microorganisms such as fecal coli form bacteria (*Escherichia coli*) etc. The major parameters analyzed include dissolved oxygen, acidity, alkalinity, chloride, hardness, pH, conductivity, total dissolved solids and salinity..



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Report No. - CEMC/UNAC/080619/W1

Issued Date-07.06.2020

WATER QUALITY TEST REPORT

Name & Address of the Client : M/s U.N AUTONOMOUS COLLEGE OF SCIENCE & TECHNOLOGY
 Date of Sampling : 02.06.2020
 Sampling by : Mr. R.N Das
 Date of Sample Received : 02.06.2020
 Sample Description : Drinking water
 Sample Quantity : 1.0 Ltr
 Sample Location : College Borewell
 Date of Analysis : 02.06.2020 to 07.06.2020
 Reference No. : CEMC-08062019W1

ANALYSIS RESULT

Sl No	Parameter	Unit	Standard as per IS: 10500	Testing Method	Result
1	Colour	Hazen	5	APHA 2120 B,C	<5
2	Odour	-	AL	APHA 2150 B	AL
3	Taste	-	AL	APHA 2160 C	AL
4	Turbidity	NTU	1	APHA 2130 B	<1
5	pH Value	-	6.5-8.5	APHA 4500H ⁺ B	7.11
6	Total Hardness (as CaCO ₃)	mg/l	200	APHA 2340 C	110
7	Iron (as Fe)	mg/l	0.3	APHA 3500Fe, B	0.16
8	Chloride (as Cl)	mg/l	250	APHA 4500Cl ⁻ B	31.9
9	Residual, free Chlorine	mg/l	0.2	APHA 4500Cl, B	ND
10	Total Dissolved Solids	mg/l	500	APHA 2540 C	244
11	Calcium (as Ca)	mg/l	75	APHA 3500Ca B	26.4
12	Magnesium (as Mg)	mg/l	30	APHA 3500Mg B	15.6
13	Copper (as Cu)	mg/l	0.05	APHA 3111 B,C	<0.03
14	Manganese (as Mn)	mg/l	0.1	APHA 3500Mn B	<0.05
15	Sulphate (as SO ₄)	mg/l	200	APHA 4500 SO ₄ ²⁻ E	20.2
16	Nitrate (as NO ₃)	mg/l	45	APHA 4500NO ₃ ⁻ E	26.6
17	Fluoride (as F)	mg/l	1.0	APHA 4500F ⁻ C	0.07
18	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	APHA 5530 B,D	<0.001
19	Mercury (as Hg)	mg/l	0.001	APHA 3500Hg	<0.001
20	Cadmium (as Cd)	mg/l	0.003	APHA 3111 B,C	<0.003
21	Selenium (as Se)	mg/l	0.01	APHA 3114 B	<0.001
22	Arsenic (as As)	mg/l	0.01	APHA 3114 B	<0.001
23	Cyanide (as CN)	mg/l	0.05	APHA 4500CN ⁻ C,D	ND
24	Lead (as Pb)	mg/l	0.01	APHA 3111 B,C	<0.01
25	Zinc (as Zn)	mg/l	5	APHA 3111 B,C	<0.05
26	Total Chromium (as Cr)	mg/l	0.05	APHA 3500Cr B	<0.05
27	Mineral Oil	mg/l	0.01	APHA 5220 B	<0.01
28	Alkalinity (as CaCO ₃)	mg/l	200	APHA 2320 B	76
29	Aluminium (as Al)	mg/l	0.03	APHA 3500Al B	<0.01
30	Boron (as B)	mg/l	0.5	APHA 4500B, B	<0.2
31	Total Coliform	--	Absent	IS 15185	Absent
32	E. Coli	--	Absent	IS 15185	Absent

NB: AL- Agreeable, ND-Not Detected

* As per the result mentioned above parameters, these are within the drinking water standard/norms.


 Authorized Signatory



Notes:

- > The result given above related to the tested sample, as received. The customer asked for the above test only.
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CHAPTER 5

SOLID WASTE GENERATED & MANAGEMENT PRACTICES

5.1 SOURCES OF SOLID WASTES IN THE CAMPUS

Solid waste is the unwanted or useless solid material generated from human activities in a residential, industrial, or commercial area. Solid waste management reduces or eliminates the adverse impact on the environment and human health. A number of processes are involved inefficiently managing waste for an organization. It is necessary to manage the solid waste properly to reduce the load on the waste management system. Solid waste generation and its management is a burning issue in current days. The rate of generation of solid waste is very high and yet we do not have adequate technology to manage the generated waste. Unscientific handling of solid waste can create threats to public health and environmental safety issues. Thus, it is necessary to manage solid waste properly to reduce the load on the waste management system. The purpose of this audit is to find out the quantity, volume, type, and current management practice of solid waste generation in the UNC campus. This report will help for further solid waste management and to go for green campus development.

Solid waste from UNC campus is collected from all the Building areas and the same is directly handed over to the Municipalities' Bin for further segregation and recycling purpose. There are different types of waste are recorded such as paper waste, plastic waste, construction waste, glass waste, etc. However biodegradable waste is recycled through the organic and vermicomposting processes. The daily rate of waste generation has been increasing in the recent time reaching up to an estimated amount of about 6tonnes per month during peak academic sessions and the

minimum amount generated during the lean period is about 4 tonnes per month. The wastes generated in the campus include;

- ❖ Kitchen wastes
- ❖ Wastes from construction sites
- ❖ Liquid waste (residential and eateries)
- ❖ Sewage and sludge
- ❖ Biomedical waste
- ❖ Chemical wastes
- ❖ Plastic wastes
- ❖ Cans and bottles
- ❖ Damaged or spoiled laboratory glassware
- ❖ Unused tools and machinery including battery
- ❖ Papers including packaging materials
- ❖ Electronics waste
- ❖ Garden waste and sweeping litters etc.

The total solid waste generated in the annual year is **40,780 Kg**.

The campus is committed by ensuring that all forms of wastes generated are handled based on the RRRR (Reduce, Reuse, Recycle, Recover) principles following appropriate source segregation protocols including safe disposal of bio, medical and hazardous wastes. There are studies from time to time to estimate the amount and nature of wastes, particularly solid waste which indicates the increasing trend of the volume. A preliminary survey reveals the domination of biodegradable components (volume basis) over the non-biodegradable counterparts in the campus. The students' hostels share the highest amount of solid waste mostly dominated by food/kitchen wastes (a substantial amount of papers, plastics, metals are also seen with waste also generated in hostels) followed by residential areas, eateries and offices including academic buildings, construction sites (occasionally), open areas including gardens and roads

5.2 WASTE MANAGEMENT SYSTEM OF THE INSTITUTE (WASTE COLLECTION PLANT)

- ❖ **NON BIODEGRADABLE WASTE MANAGEMENT**

The three steps that can be followed for management of non biodegradable waste are Recycle, Reuse, and Reduce which can save energy and other resources as well. This Institute adopts one of the safest way of disposal i.e., Land filling. The non biodegradable substances are segregated via dustbins and dumped in a low lying region nearby the campus and covered with soil.



Fig:6 Collection of non biodegradable wastes via dustbins

❖ BIODEGRADABLE WASTE MANAGEMENT

The food waste generated inside the campus is diverted to a nearby farm on a daily basis. The farm owner takes the food waste and uses it to his needs. An average of 30-35kgs of food waste is generated per day.

(i) Vermicomposting

UNC has taken initiatives for Biodegradable Waste Management by processes like Dry & Wet Waste Management. Vermicomposting technology relies upon the conjoint action of earthworms and microorganisms to rapidly transform varied types of solid wastes. Considering the simplicity and flexibility of the technology, a vermicompost unit was established in January 2020 in the campus under the supervision of the Green audit team. The prime objectives are to recycle a fraction of biodegradable waste in a sustainable manner and curtail the cost of purchasing organic manure from the market for landscaping ventures. Presently, the unit is running successfully to fulfill the need for organic manure for plantation/gardening works of the campus. So far, the ready-to-use vermicompost is produced entirely from garden waste (grass) and leaf litter of the campus.

The vermicomposting unit has a waste accommodating capacity of about 16.5 m³, i.e., about 10 quintals (on a fresh weight basis) at a given time. On average, one vermicomposting period (or one batch) takes about 60-90 days depending on the nature of the feedstock. Epigeic earthworm species (*Eisenia fetida*, *Eudrilus eugeniae*, and *Perionyx excavatus*) are applied at a rate of 10 worms/kg (approximately) feedstock to carry out the composting process. Approximately 93.52 quintal vermicompost has been produced in the last three years (i.e. April 2020 to March 2023). The produced vermicompost is used for all sorts of plantation and landscaping activities at the campus. The unit is ready for expansion to accommodate various other kinds of biodegradable solid wastes generated in the campus. Apart from utilizing the required amount of vermicompost for landscaping work, Institute is selling certain quantities to the campus dwellers.



Figure 7: Vermi-compost farm



Fig;8 Organic- waste composting

(ii) Organic Composting

Standing strong by its vision for transforming UNC into an institute which truly realizes the value of adhering to various laws and standards of environmental compliance, we always strive to arrive at possibilities for reducing and managing waste. Kitchen-waste composting is thus, an effective practice that extends its efforts towards putting every bit of waste produced. For converting organic waste into compost, an automated machine was installed in the campus with a capacity of 250 kg.

The kitchen wastes, agricultural wastes and animal wastes which constitute about 60% of the total wastes is used for generation for compost.

CHAPTER 6

ENERGY CONSUMPTION AND MANAGEMENT

Energy is one of the major inputs for the economic development of any country. The fundamental goal of energy management is to produce goods and provide services with the least cost and least environmental effect. Also, it can be said as “the strategy of adjusting and optimizing energy, using system and procedure so as to reduce energy requirements per unit of output while holding constant or reducing total costs producing the output from these systems”. The energy audit is key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy inputs with its use and serves to identify all the energy streams in a facility. Energy resources utilized by all the departments, support services, and the administrative buildings of the Institute, include Electricity, Solar Roof Top Systems, and Diesel Generators installed on the campus.

Objectives of Energy Audit

Primary:

- The first objective is to acquire and analyze data and find the necessary consumption pattern of these facilities.
- The second objective will be to calculate the wastage pattern based on the results of the first objective.
- The final objective is to find and implement solutions that are acceptable and feasible.

Secondary:

- This would be our first exposure to this field hence experience gain would be vital.
- This project will precede many follow up projects and hence helps to gain technical and management exposure required for future energy projects.

- It is sure to help create a repertoire of vital contacts hence will develop interaction with alumni, faculty and students.

Source of Energy

UNC draws Energy from the Followings:

- ❖ Electricity from TPCODL

The Following are the Major consumers of Electricity in the facility

- ❖ Lightning
- ❖ Air Conditioner
- ❖ Fans
- ❖ Computers
- ❖ Other Lab Equipment

Indirect Benefits of Energy Audit

Every time the Energy Audit is carried out it rekindles the interest in Energy Conservation as an important function. Energy Auditors sharing their experience and knowledge with the Plant Personnel helps in fueling the innovative ideas for further action of reduction in Specific Power consumption (SPC). Any loose connections or heating of cables come to timely vision. For an external agency due to unbiased vision, a few points for Energy Conservation may be visible each time they perform the audit and this would help in achieving further saving. Inform any irregularities in Energy meter HT connections for rectification.

6.1. Energy consumption in the Campus

In conducting an environmental audit of an autonomous college, it is essential to examine the energy consumption and utilization on campus. Energy plays a crucial role in every aspect of campus life, including classrooms, residential halls, laboratories, and administrative buildings.

Thus, understanding how energy is consumed and utilized is vital in identifying opportunities for efficiency and sustainability.

One significant aspect to consider is the source of energy in the campus. Analyzing whether the energy predominantly comes from non-renewable sources such as coal or oil, or from renewable sources like solar or wind power, is crucial. Transitioning towards renewable energy sources can greatly reduce the college's carbon footprint and contribute to environmental sustainability.

The next aspect to assess is the energy consumption patterns within different areas of the campus. Conducting a comprehensive survey of energy consumption in classrooms, laboratories, and residential halls can provide insights into areas where energy efficiency measures can be implemented. For instance, retrofitting buildings with energy-efficient lighting, optimizing heating and cooling systems, and promoting responsible energy usage can result in significant energy savings.

Furthermore, it is crucial to promote and educate the campus community about energy conservation and sustainable practices. Raising awareness through workshops, campaigns, and informational sessions can encourage students, faculty, and staff to adopt energy-saving habits. Additionally, providing incentives for energy-efficient behaviours, such as organizing competitions or offering rewards, can further motivate individuals to actively participate in reducing energy consumption on campus.

In conclusion, assessing energy consumption and utilization in the campus environment audit of U.N. autonomous college is vital for promoting sustainability and reducing the institution's environmental impact. By analyzing energy sources, patterns of consumption, and implementing energy-saving measures, it is possible to create a more sustainable and efficient campus. Furthermore, fostering awareness and behavior change among the campus community can lead to long-lasting energy conservation practices that benefit not only the college but also the larger environment.

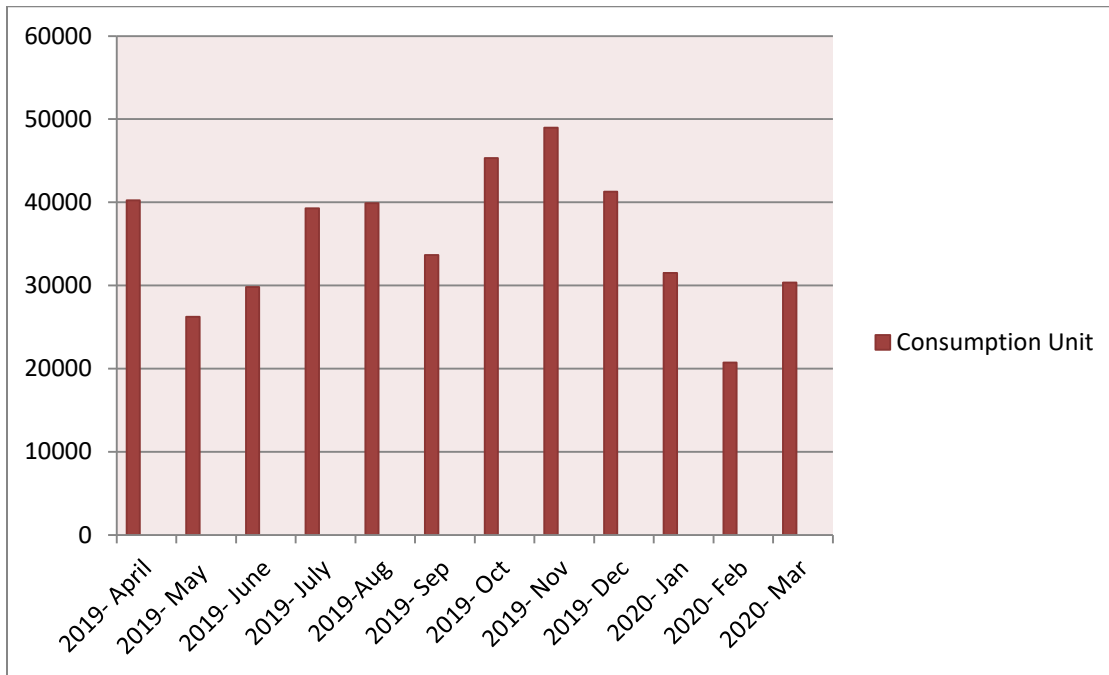
It includes energy sources, its consumption and monitoring, lighting, appliances and vehicles. Energy sources utilized by all the departments and services of college include electricity, liquid petroleum and LPG. Data for electricity consumption of the college from various buildings were collected and listed as below:

TABLE 5: Details of energy consumption

SL.NO	NAME OF APPLIANCE	WATTAGE	QUANTITY	WATTAGE
1	Tube light (LED)	20	420	8,400
2	CFL(LED)	09	225	2,025
3	Fan	80	565	45,200
4	Water Cooler	1500	05	7,500
5	Exhaust Fan	150	12	1,800
6	Aquaguard	500	12	6,000
7	Computer	200	150	30,000
8	Projector	750	7	5,250
9	Printer	500	16	8,000
11	TV(LED)	150	01	150
12	Motor(water pump)	1000	05	5,000
13	AC	2000	15	30,000
14	Submersible Pump	746	16	11,936
15	Street light	45	25	1125

TABLE 6: DETAILS OF ELECTRICITY BILL

Bill Month	Consumption Unit	Bill amount
2019- April	40245	4,06,524.00
2019- May	26234	2,50,393.00
2019- June	29828	3,20,440.00
2019- July	39285	4,13,482.00
2019-Aug	39891	4,26,571.00
2019- Sep	33669	3,63,482.00
2019- Oct	45302	4,43,307.00
2019- Nov	48964	4,55,424.00
2019- Dec	41273	4,53,953.00
2020- Jan	31513	2,30,401.00
2020- Feb	20709	1,40,401.00
2020- Mar	30360	3,76,077.00



DETAILS OF UNIT CONSUMED DURING 2019-2020



Fig:9 DG Set 250 KVA

6.2 MANAGEMENT OF ENERGY

- The college must utilize smart technology and automation systems to manage energy consumption more effectively.
- The institute must conduct energy audits to identify areas where buildings can be retrofitted for better energy efficiency. This may include upgrading insulation, windows, and doors, installing energy-efficient lighting systems, and optimizing heating, ventilation, and air conditioning (HVAC) systems. These measures can reduce energy waste and result in long-term energy and cost savings.
- The college must incorporate sustainability and energy conservation topics into the college curriculum. This can include offering courses or workshops on renewable energy, energy management, or sustainable architecture and design.
- By empowering students with knowledge and skills in sustainable practices, the college can create a generation of environmentally conscious individuals who can contribute to a more sustainable future.

- Overall, the college should adopt a holistic approach towards energy consumption and utilization, encompassing education, technology, and infrastructure upgrades, to create a more sustainable campus environment.
- By prioritizing energy efficiency and sustainable practices, the college can actively contribute to mitigating climate change and promoting environmental stewardship.

CHAPTER 7

AIR & NOISE

7.1 AMBIENT NOISE STATUS

The major source of noise in UNC is from automobiles and construction sites. At the main gate of the Campus, human communication and transportation are producing high sound levels. Ambient noise monitoring was carried out in different areas of UNC campus like at the campus entry, administration building, and construction sites and plantation areas. The sampling was carried out using calibrated Sound Level Meter (AZ 8921) by logarithmic scale in decibels (dB). The noise readings were collected in the campus and calculated. The details of noise status in UNC campus is given in the below table.

TABLE 7: NOISE LEVELS IN UNC CAMPUS

SERIAL NO.	AREA	LEQ (DB) DAY TIME
1	Main Gate	70
2	Administration block	57
3	Academic blocks	47
4	Canteen	64
5	Plantation area	59
6	Construction site	65

- ❖ All parameters expressed in dB (A) Leq. and observed under permissible limits.
- ❖ Monitoring is carried out during the daytime.

RECOMMENDATIONS

- ❖ Campus should follow the Environmental aware laws for different aspects of environmental management.
- ❖ Campus should make the rule provide posters and slogans in the campus for protecting the environment.

Noise level near the administrative building of the campus was measured by a **decibel meter** by sound professional of CEMC with great accuracy on dt.02.06.2022. The details of the report are as follows:



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Enlisted in Construction Industry Development Council (CIDC) established by the Planning Commission (Govt. of India)
MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report No. - CEMC/UNAC/080619/N1

Issued Date-07.06.2020

NOISE MONITORING TEST REPORT

Name & Address of the Client : M/s U.N AUTONOMOUS COLLEGE OF SCIENCE & TECHNOLOGY
Date of Sampling : 01.06.2020
Sampling by : Mr. B.k Samantray
Sample Description : NOISE
Reference No. : CEMC-08062019N1

ANALYSIS RESULT

Sl No.	Location	NL Day Time dB (A)			NL Night Time dB (A)		
		Max	Min.	Avg.	Max.	Min.	Avg.
1	Near Ad. Building	70.6	67.6	69.1	68.0	61.4	64.7

M. Prasad
Authorized Signatory



Notes:

- > The result given above related to the tested sample, as received. The customer is asked for the above test only.
- > This Test Report shall not be reproduced wholly or in part without prior written consent of the laboratory.
- > The samples received shall be destroyed after two weeks from the date of issue of this Test Report unless specified otherwise

Environmental Studies (EIA & EMP), Monitoring, Forest Diversion Planning, DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS & GIS, Baseline Survey, Hydrological & Geological Studies, Socio-economic Studies, DGPS & ETS Survey.

**Regd. Office: 1st Floor, N-5/305, IRC village, Nayapalli, Bhubaneswar-751015, Odisha, India, Mobile: 9861032826
E-mail- cemc_consultancy@yahoo.co.in, cemc122@gmail.com, website: www.cemc.in, Landline: 0674-2360344.**

Laboratory At: Plot No. 800/1274, Johal, Pahal, Bhubaneswar-752101,
E-mail: cemclab@yahoo.in, Mobile: 9937631956, 8895177314

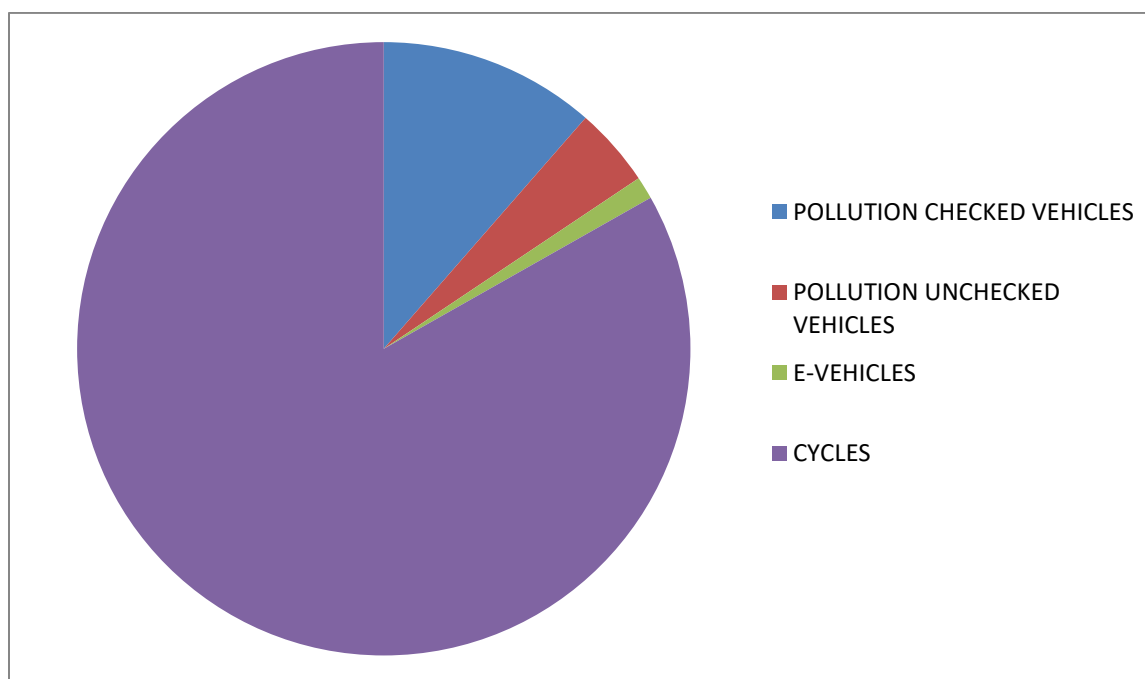
7.2 AMBIENT AIR QUALITY STATUS

- ❖ Central Pollution Control Board, New Delhi initiated National Ambient Air Quality Monitoring (NAAQM) program in the year 1984 to get a spatial and temporal variation of ambient air concentrations for a wide range of pollutants that are considered relevant for evolving strategic.

- ❖ A vehicle information data in the Pre audit stage of the college campus was collected through Google form. It was found that only 71.2% vehicle owner had pollution checked certificates. Based upon this, the administration made it mandatory to obtain PUC for all the vehicles inside the campus.

PRE-AUDIT STAGE

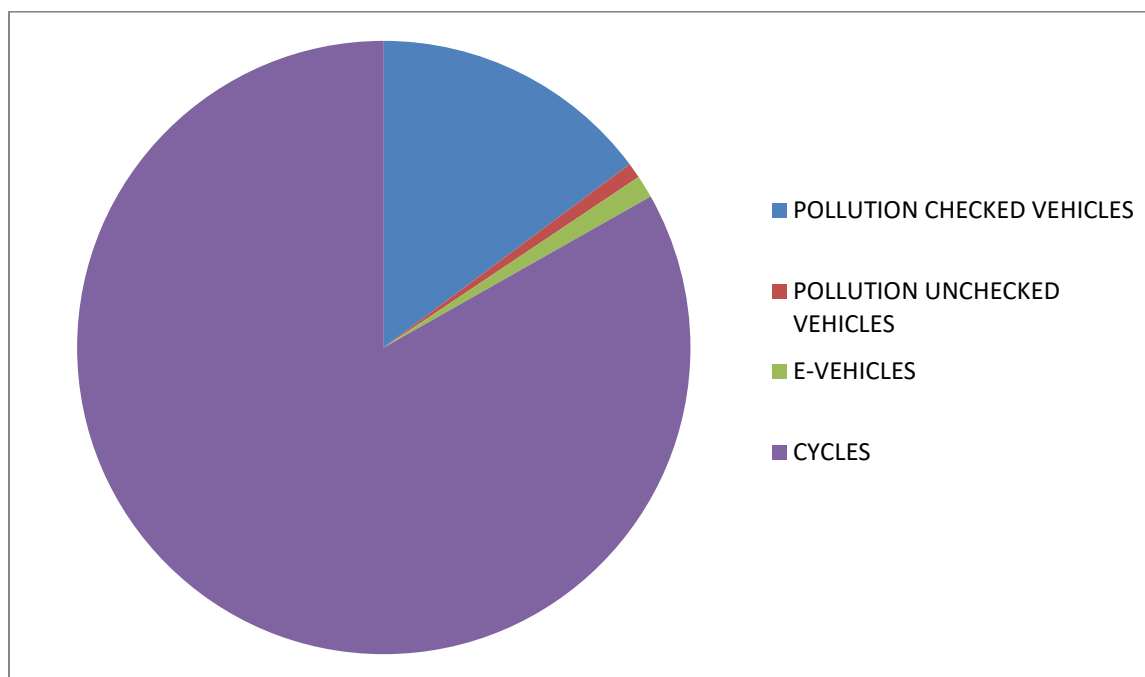
No. of Cycles	No. of Two Wheelers	Pollution Checked Two wheelers	No. of Four Wheelers	Pollution Checked Four Wheelers	No. of e-vehicles
1332	217	150	21	15	08



Pre audit Pollution status of vehicles

POST-AUDIT STAGE

No. of Cycles	No. of Two Wheelers	Pollution Checked Two wheelers	No. of Four Wheelers	Pollution Checked Four Wheelers	No. of e-vehicles
1232	217	212	21	19	10



Post audit Pollution status of vehicles

Under NAMP (National Air Quality Monitoring Program), three air pollutants viz., Sulphur dioxide (SO₂), Nitrogen dioxides (NO₂), and Respiratory Suspended Particulate Matter (RSPM/PM10) have been identified for regular monitoring at various locations. Monitoring of pollutants has been carried out for 24 hours (4-hourly sampling for gaseous pollutants and 8-hourly sampling for particulate matter) as per CPCB monitoring protocol. One **Respirable Dust Sampler (RDS)** machine is installed at the Main Gate of the Campus which monitored the changes in ambient air quality during 24- hours. The trees cover on the campus is the leading sources to absorb CO₂ and release enough fresh O₂ across the Campus. The result shows that the Campus's air quality status is good as compared to other locations. It is identified that the campus

is a green campus. UNC campus observed minimum air pollution as compared to other Ambient Air Pollution Centers located in different parts of the city.

The air sample analyzed by analytical method is as follows:



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Report No. - CEMC/UNAC/080619/A1

Issued Date-07.06.2020

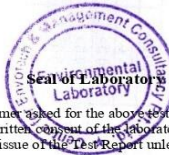
AMBIENT AIR QUALITY TEST REPORT

Name & Address of the Client : M/s U.N AUTONOMOUS COLLEGE OF SCIENCE & TECHNOLOGY
 Date of Sampling : 01.06.2020
 Sampling by : Mr. B.k Samantray
 Date of Sample Received : 01.06.2020
 Sample Description : AMBIENT AIR
 Sample Quantity : 1 kg
 Sample Location : Near Admin Building
 Date of Analysis : 01.06.2020 to 05.06.2020
 Reference No. : CEMC-08062019A1

ANALYSIS RESULT

Parameter	Unit	Result	NAAQ Standard
Particulate Matter (PM10)	µg/m ³	54.6	100
Particulate Matter (PM2.5)	µg/m ³	32.8	60
Sulphur Dioxide (SO ₂)	µg/m ³	9.2	80
Nitrogen Oxides (NO _x)	µg/m ³	14.4	80

M. Prasad
 Authorized Signatory



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 E-mail: cemclab@yahoo.in, Mobile: 9937631956, 8895177314

CHAPTER 8

SUSTENANCE OF GREEN COVER IN THE CAMPUS

Udayanath College covers an area of about 30 acres. The major portion is covered with vegetation and the main aim is to protect and conserve its biodiversity, fresh and clean ambiance through many initiatives. But on 3rd May ,2019, cyclone FUNI significantly impacted the biodiversity of the UNC Campus causing substantial damage to both floral and final diversity.

Greeneries of the campus







UNC campus was impacted by the cyclone FUNI



CHAPTER 9

BIODIVERSITY OF THE CAMPUS

9.1. FLORAL DIVERSITY OF UNC

UNC is within the geo-position between latitude 20.211299⁰N and longitude 86.015066⁰E, Prachi Jnanapitha, Adaspur, Cuttack, Odisha, India. It encompasses an area of about 30 acres. The area is immensely diverse with a variety of tree species performing a variety of functions. Most of these tree species are planted in different periods of time through various plantation programmes organized by the college authority & have become an integral part of the college. The trees of the college have increased the quality of life, not only the college fraternity but also the people around the college in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting the faunal species, controlling climate by moderating the effects of the sun, rain & wind. Leaves absorb the radiant energy of the sun, keeping things cool in summer. Many species of birds are dependent on these trees mainly for food & shelter. Nectars of different flowers & plants is a favorable source of food for birds & squirrels. Different species display a seemingly endless variety of shapes, forms, texture & vibrant colors. Even individual trees vary their appearance throughout the course of the year as the seasons change. The strength, long lifespan & regal stature of trees give them a monument like quality. They also remind us the glorious history of our institution in particular. A thick belt of large shady trees in the periphery of the college have found to be bringing down noise & cut down dust & storms. Thus the college has been playing a significant role in maintaining the environment of the entire Adaspur village.

TABLE 1: LIST OF FLORAL SPECIES OF UNC**TABLE 1.1: TREE SPECIES OF UNC**

SERIAL NO.	PLANT NAME	COMMON ODIA NAME	FAMILY
1.	<i>Bauhinia purpurea</i>	Barada	Caesalpiniaceae
2.	<i>Bauhinia variegata</i>	Kanchana	Caesalpiniaceae
3.	<i>Bixa orellana</i>	Sindura	Bixaceae
4.	<i>Elaeocarpus sphaericus</i>	Rudraksh	Elaeocarpaceae
5.	<i>Feronia limonia</i>	Kaitha	Rutaceae
6.	<i>Ficus elástica</i>	Rubber	Moraceae
7.	<i>Ficus hispida</i>	Dimiri	Moraceae
8.	<i>Gardenia gummifera</i>	Bhurudu	Rubiaceae
9.	<i>Litchi chinensis</i>	Litchu	Sapindaceae
10.	<i>Litsea glutinosa</i>	Jaisandh	Lauraceae
11.	<i>Michelia champaca</i>	Champa	Magnoliaceae
12.	<i>Mimusops elengi</i>	Baula	Sapotaceae
13.	<i>Nerium oleander</i>	Koribiro	Apocyanaceae
14.	<i>Punica granatum</i>	Dalimba	Lythraceae
15.	<i>Syzygium cumini</i>	Jamu	Myrtaceae
16.	<i>Terminalia catappa</i>	Almond	Combretaceae
17.	<i>Terminalia bellirica</i>	Baheda	Combretaceae
18.	<i>Terminalia chebula</i>	Harida	Combretaceae
19.	<i>Thevetia peruviana</i>	Kanior	Apocyanaceae
20.	<i>Vitex negundo</i>	Nirgundi	Verbenaceae
21.	<i>Ziziphus jujuba</i>	Bara koli	Rhamnaceae

SUPPORTING PHOTOGRAPHS



Bauhinia purpurea



Bauhinia variegata



Bixa orellana



Elaeocarpus sphaericus



Feronia limonia



Ficus elástica



Ficus hispida



Gardenia gummiifera



Litchi chinensis



Litsea glutinosa



Michelia champaca



Mimusops elengi



Nerium oleander



Punica granatum



Syzygium cumini



Terminalia catappa



Terminalia bellirica



Terminalia chebula



Thevetia peruviana



Vitex negundo



Ziziphus jujuba

TABLE 1.2: HERB SPECIES OF UNC

SERIAL NO.	PLANT NAME	COMMON ODISIA NAME	FAMILY
1.	<i>Achyranthes aspera</i>	Apamaranga	Amaranthaceae
2.	<i>Adhatoda vasica</i>	Basanga	Acanthaceae
3.	<i>Alternanthera sessilis</i>	Madaranga	Amaranthaceae
4.	<i>Amaranthus viridis</i>	Leutia	Amaranthaceae
5.	<i>Blumea lacera</i>	Pokasungha	Asteraceae
6.	<i>Boerhavia diffusa</i>	Purunei saga	Nyctaginaceae
7.	<i>Cephalandra indica</i>	Kainchi kakudi	Cucurbitaceae
8.	<i>Commelina kurzii</i>	Kanisiri	Commelinaceae
9.	<i>Commelina longifolia</i>	Pani kanisiri	Commelinaceae
10.	<i>Cynodon dactylon</i>	Duba ghasa	Poaceae
11.	<i>Dactyloctenium aegyptium</i>	Kakuria	Poaceae
12.	<i>Desmodium triflorum</i>	Kuradhia	Fabaceae
13.	<i>Echinochloa colona</i>	Suan	Poaceae
14.	<i>Eclipta prostrata</i>	Bhringaraj	Asteraceae
15.	<i>Elettaria cardamomum</i>	Elaichi	Zingiberaceae
16.	<i>Hedychium coronarium</i>	Arnapurna	Zingiberaceae
17.	<i>Heliotropium indicum</i>	Hatisundha	Boraginaceae
18.	<i>Helioconia rostrata</i>	Chingudia	Musaceae
19.	<i>Hydrolea zeylanica</i>	Nilatara	Hydrophyllaceae
20.	<i>Ipomoea nil</i>	Nilkamal	Convolvulaceae
21.	<i>Ipomoea pes-tigridis</i>	Bileipada	Convolvulaceae
22.	<i>Leptochloa chinensis</i>	Bhuru	Poaceae
23.	<i>Mikania micrantha</i>	Salmari	Asteraceae
24.	<i>Mimosa pudica</i>	Lajakuli	Mimosaceae
25.	<i>Mollugo pentaphylla</i>	Pita saga	Molluginaceae
26.	<i>Oxalis corniculata</i>	Kumari	Oxalidaceae
27.	<i>Paederia foetida</i>	Pasaruni	Rubiaceae

28.	<i>Rothia indica</i>	Papara	Fabaceae
29.	<i>Saccharum spontaneum</i>	Kasatandi	Poaceae
30.	<i>Vernonia cinerea</i>	Begonia	Asteraceae
31.	<i>Catharanthus roseus</i>	Sadabihari	Apocyanaceae

SUPPORTING PHOTOGRAPHS



Achyranthes aspera



Adhatoda vasica



Alternanthera sessilis



Amaranthus viridis



Blumea lacera



Boerhavia diffusa



Catharanthus roseus



Cephalandra indica



Commelina kurzii



Commelina longifolia



Cynodon dactylon



Dactyloctenium aegyptium



Desmodium triflorum



Echinochloa colona



Eclipta prostrata



Elephantopus scaber



Helioconia rostrata



Heliotropium indicum



Hydrolea zeylanica



Ipomoea nil



Ipomoea pes-tigridis



Leptochloa chinensis



Mikania micrantha



Mimosa púdica



Mollugo pentaphylla



Oxalis corniculata



Paederia foetida



Rothia indica



Saccharum spontaneum



Vernonia cinerea

TABLE 1.3: SHRUB SPECIES OF UNC

SERIAL NO.	PLANT NAME	COMMON ODI A NAME	FAMILY
1.	<i>Desmodium gangeticum</i>	Salafeni	Fabaceae
2.	<i>Gardenia jasminoides</i>	Sugandharaj	Rubiaceae
3.	<i>Glycosmis pentaphylla</i>	Chauladhua koli	Rutaceae
4.	<i>Gymnema sylvestre</i>	Gudamari	Apocyanaceae
5.	<i>Hemidesmus indicus</i>	Anantamula	Periplocaceae
6.	<i>Ixora finlaysoniana</i>	Telakuria	Rubiaceae
7.	<i>Jasminum multiflorum</i>	Banamalli	Oleaceae
8.	<i>Jasminum sambac</i>	Malli	Oleaceae
9.	<i>Juniperus communis</i>	Hapuspa	Cupressaceae
10.	<i>Justicia gendarussa</i>	Bada basanga	Acanthaceae
11.	<i>Lantana cámara</i>	Futus	Verbenaceae
12.	<i>Nyctanthes arbor-tristis</i>	Singadahara	Oleaceae
13.	<i>Plumbago zeylanica</i>	Chintamani	Plumbaginaceae
14.	<i>Plumeria rubra</i>	Kathachampa	Apocyanaceae
15.	<i>Rauvolfia tetraphylla</i>	Patalagaruda	Apocyanaceae
16.	<i>Syzygium jambos</i>	Jamabarai	Myrtaceae
17.	<i>Urena lobata</i>	Bilakapasia	Malvaceae
18.	<i>Urena sinuata</i>	Aramina	Malvaceae

SUPPORTING PHOTOGRAPHS



Desmodium gangeticum



Gardenia jasminoides



Glycosmis pentaphylla



Gymnema sylvestre



Hemidesmus indicus



Ixora finlaysoniana



Jasminum multiflorum



Jasminum sambac



Juniperus communis



Justicia gendarussa



Lantana cámara



Nyctanthes arbor-tristis



Plumbago zeylanica



Plumeria rubra



Rauvolfia tetraphylla



Syzygium jambos



Urena lobata



Urena sinuata

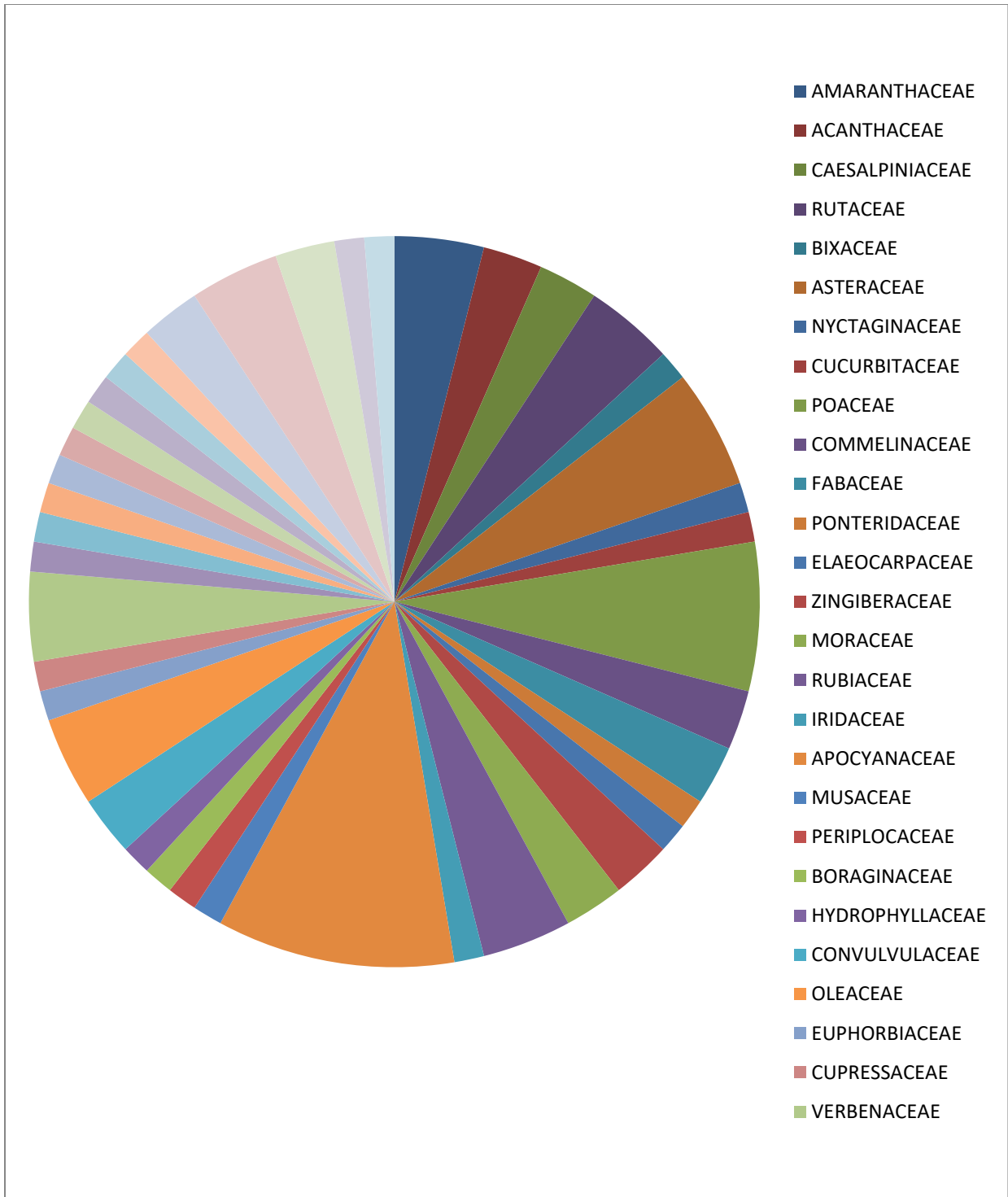


Figure 3: Family wise distribution of total plant species in UNC Campus, Cuttack

1. FAUNAL DIVERSITY OF UNC

UNC is located in Adaspur, Cuttack district of Odisha. Though Cuttack district is highly industrialized but the location of the college at Adaspur makes a very peaceful, calm & studious environment. It's a place which situated a little far from the core city of Cuttack. It's basically a rural area with high healthy fresh environment. The temperature variation always fluctuates between the core city of Cuttack & Adaspur. During summer while the temperature of the core city raises up to 45°C the College area shows about 37°C only (around May- early June). Summer rain is normal, & is principally caused from late July to August by the moisture-laden South-West Monsoon, on striking the Eastern Ghats foot hills. The climatic condition of Adaspur as a whole & UNC in particular is very suitable for a wide variedly of flora & fauna to support its rich biodiversity.

TABLE 2: LIST OF FAUNAL SPECIES OF UNC, ADASPUR, CUTTACK

SERIAL NO.	COMMON ENGLISH NAME	SCIENTIFIC NAME
1.	Common Myna	<i>Acridotheres tristis</i>
2.	Bank Myna	<i>Acridotheres ginginianus</i>
3.	House Sparrow	<i>Passer domesticus</i>
4.	House Crow	<i>Corvus splendens</i>
5.	Cuckoo	<i>Cuculidae</i>
6.	Snake	<i>Naja naja</i>
7.	Yellow Wasp	<i>Ropalidia marginata</i>
8.	Butterfly	<i>Danaus genutia</i>
9.	Common Wood shrike	<i>Tephrodornis pondicerianus</i>
10.	Pied Myna	<i>Gracupica contra</i>
11.	Skylark	<i>Aluda gulgula</i>
12.	Garden Tiger Moth	<i>Arctia caja</i>
13.	Little Owl	<i>Athene brama</i>
14.	Oleander Moth	<i>Syntomeidal epilais</i>
15.	Slender Skimmer	<i>Orthetrum Sabina</i>

SUPPORTING PHOTOGRAPHS



Acridotheres tristis



Acridotheres ginginianus



Passer domesticus



Corvus splendens



Naja naja



Danaus genutia



Ropalidia marginata



Cuculidae



Tephrodornis pondicerianus



Gracupica contra



Athene brama



Arctia caja



Orthetrum Sabina



Syntomeidal epilais

CHAPTER 10

SUGGESTIONS & RECOMMENDATIONS

- A frequent visit should be conducted to ensure that the generated waste is measured, monitored and recorded regularly and information should be made available to administration.
- The solid waste should be reused or recycled at maximum possible places.
- Reducing the use of one-time use plastic bottles, cups, folders, pens, bouquets, decorative items will be useful to solve the problem of plastic pollution to some extent.
- Biodegradable waste is used efficiently for composting and vermicomposting.
- Use of LED lamps and Tube Lights is to be encouraged.
- Toilets and bathrooms are consuming more water in the departments. The replacement of old taps can be beneficial for solving this issue. The use of electric cars on the campus is a good initiative to save fuel.
- The overall ambient air quality on the campus is good while some air quality issues that may arise due to developmental activities on the campus should be addressed.
- The sound levels on the campus are good. Science departments are following the principles of Green Chemistry to reduce chemical waste.
- An environmental policy document has to be prepared with all the recommendations and current practices carried by the UNC. A frequent visit should be conducted to ensure that the generated waste is measured, monitored and recorded regularly and information should be made available to the administration.
- The UNC should develop internal procedures to ensure its compliance with environmental legislation and responsibility should be fixed to carry out it in practice. The solid waste should be reused or recycled at maximum possible places.

CHAPTER 11

CONCLUSION

Environment Audit is one of the important tools to check the balance of natural resources and its judicious use. Environment auditing is the process of identifying and determining whether institutional practices are eco-friendly and sustainable. It is a process of regular identification, quantification, documenting, reporting and monitoring of environmentally important components in a specified area.. The main objective to carry out green audit is to check the green practices followed by UNC and to conduct a well-defined audit report to understand whether the UNC is on the track of sustainable development.

From the environment audit following are the conclusions, which can be taken for improvement in the campus.

- Food waste generated in campus is mostly from is collected from dining areas of 3 ladies and 2 gents hostel. The food waste is diverted to vermi-compost farm.
- E-wastes are segregated, handled and disposed properly in an eco-friendly manner.
- Reducing the use of one-time use plastic bottles, cups, folders, pens, bouquets, decorative items will be useful to solve the problem of plastic pollution to some extent.
- Rainwater is collected from rooftop to recharge the ground water level table.

The environmental audit of U.N. Autonomous College has showcased both successes and areas needing attention. It's imperative for the college administration to prioritize sustainability and swiftly address environmental concerns. Through the adoption of suggested strategies, the college has the potential to set an example for other academic institutions, championing environmental responsibility and paving the way for a sustainable tomorrow.