

ENVIRONMENT & ENERGY AUDIT REPORT
OF
K.C. DAS COMMERCE COLLEGE
2023-24



www.kcdccollege.ac.in

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Introduction

A Green Audit involves the systematic assessment and documentation of various aspects of environmental diversity prevailing within a prescribed perimeter. This process includes identifying, measuring, recording, analysing, and reporting environmental components within the domain of influence of an organization. It also promotes eco-friendly practices by evaluating both internal and external environmental initiatives.

Additionally, a Green Audit assesses resource consumption, such as water and energy usage, identifying areas for improvement to enhance efficiency. By fostering environmental awareness, ethical responsibility, and health consciousness, it helps stakeholders understand their ecological impact. Higher education institutions should prioritize Green Audits to assess and enhance their role in building a sustainable future.

Rapid urbanization, environmental degradation, and global economic challenges have led to numerous ecological crises, with climate change emerging as the most pressing issue of our time. Global warming is accelerating at an alarming rate, surpassing previous predictions. However, effective measures exist to mitigate and even reverse its impact. As the UN Secretary-General stated, *"The climate emergency is a race we are losing, but it is a race we can win."*

In this context, it is crucial for educational institutions to adopt the *Green Campus System* to promote sustainable development and enhance carbon sequestration. By minimizing greenhouse gas emissions, particularly CO₂, institutions can play a significant role in combating climate change and fostering environmental responsibility.

The National Assessment and Accreditation Council (NAAC) has mandated that all Higher Educational Institutions (HEIs) submit an annual Green Audit Report. Additionally, it is the responsibility of HEIs, as part of their Corporate Social Responsibility, to actively contribute to reducing global warming through carbon footprint reduction initiatives.

Objectives of the Green Audit:

The primary goal of the Green Audit is to ensure that the environmental practices implemented within the college campus align with the national Green Policy. This audit aims to assess, quantify, and prioritize a framework for environmental sustainability. The key objectives include:

1. **Mapping the geographical location** of the institution.

2. **Documenting environmental conditions**, including air and water quality, as well as evaluating the campus for noise pollution, smoke emissions, and the presence of plastic or other non-degradable waste.
3. **Assessing energy consumption** to optimize usage and promote efficiency.
4. **Recording the waste management system** and evaluating its effectiveness.
5. **Documenting initiatives to maintain health and well-being** for all stakeholders.
6. **Surveying the floral and faunal diversity** within the campus.
7. **Reporting the financial investment** in green initiatives and sustainability efforts.

By conducting a Green Audit, institutions can systematically evaluate their environmental impact and implement necessary improvements for a more sustainable and eco-friendly future

Methodology

The Green Audit methodology involves data collection, physical inspection of the campus, observation, review of relevant documents, and comprehensive data analysis to assess environmental sustainability.

About the College

K.C. Das Commerce College, established in 1983, is a premier higher education institution primarily focused on commerce, management, and computer education. The college serves approximately 3,000 students from Assam, the Northeast, and other states across India.

The institution offers undergraduate programs in Commerce, Arts, Science, BBA, and BCA, along with postgraduate courses in Commerce and Computer Science (PGDCA), supported by thirteen academic departments. Additionally, the college hosts distance learning centers affiliated with Indira Gandhi National Open University (IGNOU) and Gauhati University (GUCDOE), expanding educational accessibility beyond traditional classrooms.

Vision of the College

- To cater to the growing demand for commerce education at the tertiary level and harness the potential of aspiring youth in the state.
- To uphold the ethos of national education policies, remain relevant over time, and contribute to nation-building and development.

- To instil in students the courage to embrace creativity, inclusivity, innovation, integrity, and quality, while fostering the skills and adaptability needed to meet contemporary challenges.
- To promote excellence in teaching, research, interdisciplinary education, leadership, and community outreach.
- Our philosophy integrates intellect with human values, aligning perfectly with our motto: *"To Strive, To Seek, To Learn, and Not to Yield."*

Mission of the College

- To empower students through quality education and holistic development.
- To establish a model learning institution that fosters a supportive and participatory academic environment.
- To make higher education accessible to underprivileged sections of society.
- To encourage students to explore their talents through co-curricular activities in culture, literature, sports, and community engagement.
- To promote interdisciplinary research and education across academic, institutional, national, and cultural boundaries.
- To maintain relevance in an evolving educational landscape and achieve academic excellence aligned with societal needs.
- To nurture responsible citizens by instilling honesty, integrity, and ethical conduct, encouraging students to contribute meaningfully to nation-building.
- To assist parents in assessing their children's progress and guiding them toward their full potential.
- To support teachers in self-improvement through continuous professional development and self-assessment.

Goals and Objectives

To fulfil institutional Vision and Mission, the College has set forth the following objectives:

- Encourage students to engage in self-assessment and openly communicate their academic needs with teachers and administrators.
- Provide additional academic support to help students improve their performance.

- Offer diverse educational opportunities, including skill enhancement, employability training, value-added courses, and tutorials.
- Foster an innovative and dynamic learning environment.
- Instill a sense of cultural identity, patriotism, and ethical values in students.
- Promote student engagement in extracurricular activities such as cultural programs, literary events, sports, and community service.
- Encourage and cultivate a strong research culture among faculty members.

Green Auditing

K.C. Das Commerce College has actively embraced the *Green Campus* concept to promote environmental conservation and sustainability while instilling these values in students. The institution is committed to minimizing its environmental footprint while fostering a learning environment that supports both academic growth and student well-being. Through systematic evaluation of resource utilization, waste management, and carbon footprint reduction, the institution strives to promote an environmentally conscious campus and contribute to a sustainable future.

General Overview of Land Use

The College is located in an urban setting with a high population density of **13,190 people per km²**. Notably, **20% of the local population falls within the 20–29 age group**, indicating a significant presence of youth. Additionally, the area serves as a major commercial hub in Guwahati, contributing to its dynamic and bustling atmosphere.

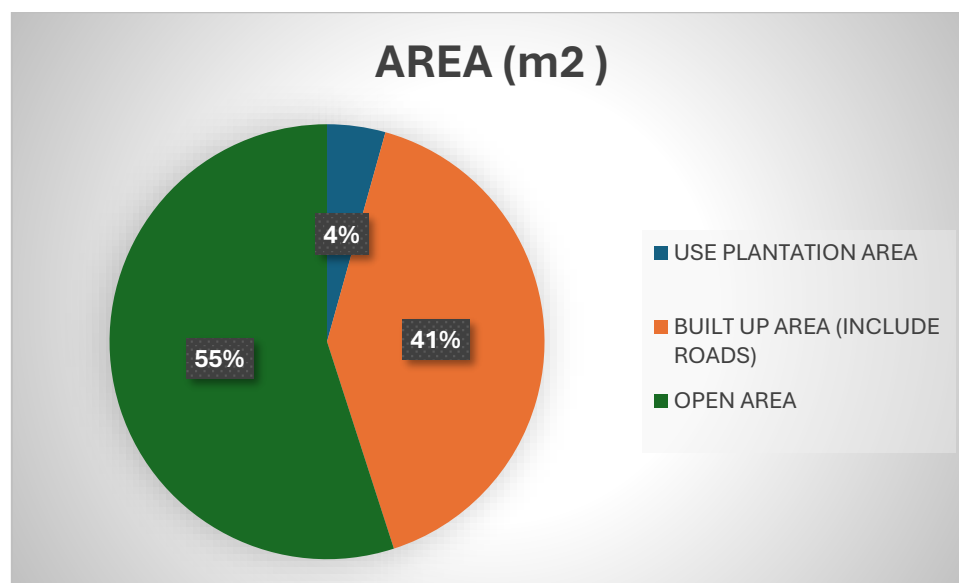
The college campus is built on **reclaimed marshy land**, previously a waste-filled site, demonstrating a conscious effort toward land utilization and urban sustainability. The institution is geographically positioned at **26.17396° N latitude and 91.74187° E longitude** and is located within the Guwahati City at a distance of 37 kms from Lokapriya Gopinath Bordoloi International (LGBI) Airport, Borjhar, Guwahati and 3 kms from Guwahati Railway Station.

Address: K.C. Das Commerce College, K. C. Road, Chatribari, P.O.: Rehabari, Guwahati, Pin- 781008, District: Kamrup(M), Assam

Table 1: Land use area in the College

CATEGORIES OF LAND	AREA (m ²)
USED PLANTATION AREA	192.06
BUILT UP AREA (INCLUDE ROADS)	1803.60
OPEN AREA	2436.57
TOTAL AREA	4432.23

Fig 1: Land use Pattern



Land Use (Built-Up Area) Analysis

The college campus comprises **four main buildings**, including a **canteen** and a **security quarter**, with a total built-up floor area of **6,401.10 sq. meters**. Key infrastructure includes:

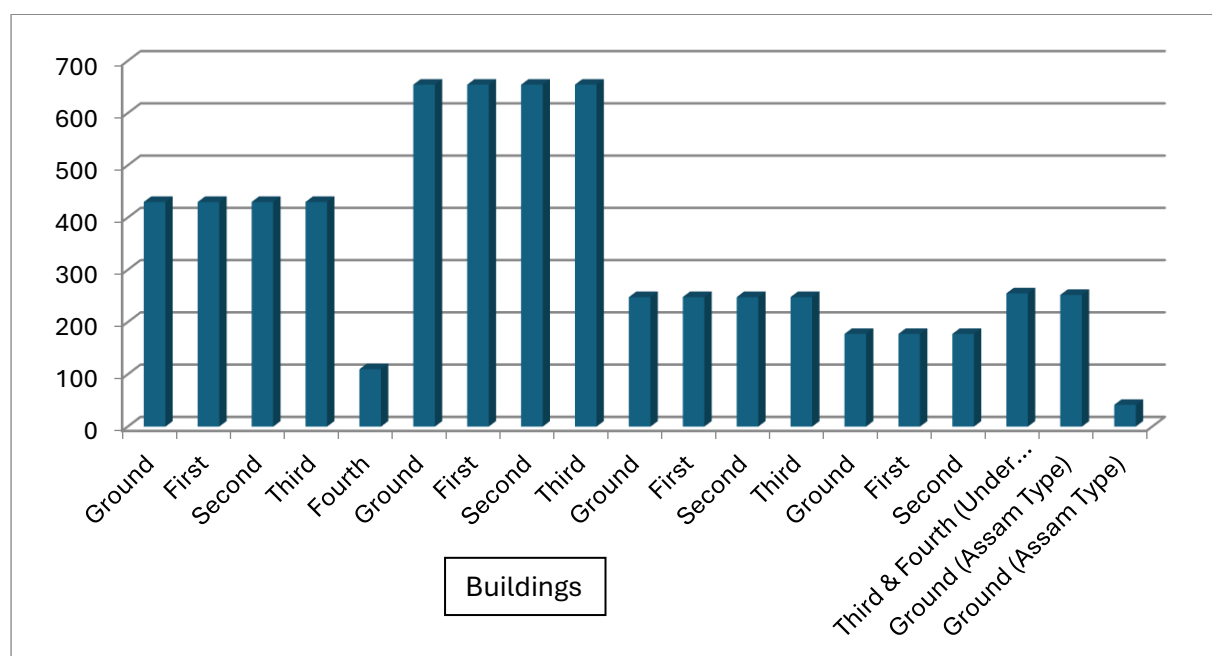
- Main Administrative Block
- Library
- Faculty Rooms
- Academic Departments
- Student Rest and Recreation Centres
- Classrooms and Conference Halls
- Canteen, Day Care Centre, Gymnasium

These facilities collectively support the academic, administrative, and recreational needs of students and staff, ensuring a well-equipped and sustainable campus environment.

Table 2: Area occupied by various buildings at K. C Das Commerce College, Guwahati

Building Name	Floor	Floor area
1 (North-East)	Ground	430
	First	430
	Second	430
	Third	430
	Fourth	110
2 (West)	Ground	654.5
	First	654.5
	Second	654.5
	Third	654.5
3 (South-East)	Ground	248
	First	248
	Second	248
	Third	248
New Building	Ground	177.5
	First	177.5
	Second	177.5
	Third & Fourth (Under construction)	255
Canteen	Ground (Assam Type)	252
Residential (Security Quarter)	Ground (Assam Type)	41.6
Total (Built up area)		6401.1

Fig. 2: Area covered under different buildings and floors



Eco-Friendly Initiatives at K.C. Das Commerce College

K.C. Das Commerce College has maintained an environmentally friendly campus, actively promoting sustainability through regular plantation programs. The college cultivates both **shade and fruit-bearing trees**, fostering an **indigenous floral ecosystem** while enhancing the campus's aesthetic appeal. Despite spatial constraints, the college effectively utilizes its land, ensuring **60% of the available area remains open and green**, thereby creating a **healthy academic and ecological environment**.

Biodiversity of the Campus

The college was developed by reclaiming a **waste marshy area**, resulting in limited natural vegetation. However, through continuous **afforestation efforts**, the campus now sustains **moderate floral diversity**, including both ornamental and ecologically significant plants.

Notable Plant Species

Beyond ornamental floriculture, the following plant species contribute to the campus's green ecosystem:

- **Trees:** Hilika (*Terminalia chebula*), Mango (*Mangifera indica*), Jackfruit (*Artocarpus heterophyllus*), Gold Mohur (*Delonix regia*), Neem (*Azadirachta indica*), Amlokhi / Indian Gooseberry (*Phyllanthus emblica*), Jalpai / Indian Olive (*Elaeocarpus serratus*), Guava (*Psidium guajava*), Devadaru (*Cedrus deodara*), Opposite Leaf Fig (*Ficus hispida*), Sacred Fig (*Ficus religiosa*), and False Ashoka (*Monoon sp.*).
- **Herbs and Shrubs:** Sensitive Plant (*Mimosa sp.*), Saga Tree (*Adenantherrapavonina*), Taro (*Colocasia sp.*), Asian Taro (*Alocasia sp.*).
- **Seasonal Growth:** Various **mushroom species** appear during the rainy season, reflecting the **healthy soil ecosystem** maintained on campus.

Faunal Diversity

A variety of **butterflies, insects, amphibians, reptiles, and mammals** inhabit the college campus, enhancing its ecological richness.

Butterflies & Spiders:

- Giant Golden Orb Weaver (*Nephila pilipes*)
- Plain Tiger Butterfly (*Danaus chrysippus*)

- Common Mime Swallowtail (*Papilio clytia*)
- Common Mormon Swallowtail (*Papilio polytes*)
- Spotted Zebra (*Graphiummegarus*)
- Dusky Partwing (*Psolosfuligo*)
- Common Castor Butterfly (*Ariadne merione*)
- Jungle Glory (*Thaumantisdiores*)
- Long-Brand Bushbrown (*Mycalesisvisala*)

Insects & Arachnids:

- Orb-weaver spider (*Argiope pulchella*)
- Huntsman spiders (*Heterpodavenatoria*)
- Tropical tent web spider (*Cyrtophoracitricola*)
- Semi-coppered heavy jumper (*Hyllus semicupreus*)
- Orb web spider (*Eriovixia* sp.)
- Ant-mimicking jumping spiders(*Myrmarachne* sp.)
- Anson's house jumper (*Hasariusadansoni*)
- Jumping spider (*Plexippus paykulli*)
- Pantropical Huntsman Spider (*Heteropodavenatoria*)
- Indian Black Ant (*Camponotuscompressus*)
- Yellow Crazy Ant (*Anoplolepisgracilipes*)
- Asian Honeybee (*Apis cerana*)
- Oriental Beetle (*Exomalaorientalis*)
- Aphids (*Apis* sp.)
- Giant Ghost Dragonfly (*Bradinopygageminata*)
- Hooded Darlet Damselfly (*Agriocnemiskalinga*)
- American Cockroach (*Periplaneta americana*)

Mollusks & Annelids:

- Giant African Land Snail (*Lissachatinafulica*)
- Earthworm (*Lampitomauritii*)

Amphibians:

- Common Asian Toad (*Duttaphrynus melanostictus*)
- Orissa Cricket Frog (*Fejervarya orissaensis*)
- Pierre's Cricket Frog (*Minervarya pierrei*)
- Narrow-Mouthed Frog (*Microhyla ornata*)
- Indian Bullfrog (*Hoplobatrachustigerinus*)
- Assam Frog (*Hydrophylax leptoglossa*)
- Bharno Frog (*Humerana humeralis*)
- Common Tree Frog (*Polypedates leucomystax*)

Reptiles:

- Chequered Keelback (*Xenochrophis piscator*)
- Indian Rat Snake (*Ptyas mucosus*)
- Wolf Snake (*Lycodon aulicus*)
- Monocellate Cobra (*Naja kaouthia*)
- Oriental Garden Lizard (*Calotes versicolor*)
- Asian House Gecko (*Hemidactylus frenatus*)
- White-Spotted Skink (*Riopa albopunctata*)
- Spotted Skink (*Sphenomorphus maculatus*)

Mammals:

- Indian Grey Mongoose (*Herpestes edwardsii*)

Avian Diversity of the Campus

The campus hosts a **highly diverse avian population**, with approximately **30 recorded bird species**. These birds contribute to the ecological balance and vibrancy of the college environment. Notable species include:

- **Kingfishers & Barbets:** White-Throated Kingfisher (*Halcyon smyrnensis*), Blue-Throated Barbet (*Psilopogon asiaticus*), Coppersmith Barbet (*Psilopogon haemacephalus*).

- **Parrots & Starlings:** Rose-Ringed Parakeet (*Psittaculakrameri*), Chestnut-Tailed Starling (*Sturniamalabarica*), Crested Myna (*Acridotheres cristatellus*), Common Myna (*Acridotheres tristis*).Asian Pied Starling (*Gracupica contra*)
- **Egrets & Herons:** Intermediate Egret (*Ardea intermedia*), Cattle Egret (*Bubulcus ibis*), Pond Heron (*Ardeolagravii*), Purple Heron (*Ardea purpurea*).
- **Doves & Pigeons:** Rock Pigeon (*Columba livia*), Spotted Dove (*Spilopelia chinensis*).
- **Bulbuls & Sparrows:** Red-Vented Bulbul (*Pycnonotus cafer*), House Sparrow (*Passer domesticus*), Tree Sparrow (*Passer montanus*).
- **Flycatchers & Sunbirds:** Magpie Robin (*Copsychussaularis*), Purple Sunbird (*Cinnyris asiaticus*), Cinereous Tit (*Parus cinereus*).
- **Swallows & Swifts:** Barn Swallow (*Hirundo rustica*), Swiftlet (*Collocalia sp.*).

Other Birds: White-Breasted Waterhen (*Amaurornisphoenicurus*), Scaly-Breasted Munia (*Lonchura punctulata*), Black Drongo (*Dicrurusmacrocerus*), Brown Shrike (*Lanius cristatus*), Common crow (*Corvus macrorhynchos*), Woodpecker (*Picidae sp.*), Cormorants (*Phalacrocorax sp.*), Common Kestrel (*Falco tinnunculus*), Asian Koel (*Eudynamysscolopaceus*), Whistling Duck (*Dendrocygna javanica*)White wagtail (*Motacilla alba*), Cinereous Tit (*Parus cinereus*), Red vented Bulbul (*Pycnonotus cafer*), Oriental Magpie Robin (*Copsychussaularis*)

Conclusion

Despite its urban setting and limited space, K.C. Das Commerce College has successfully established a **green refuge of wildlife**, demonstrating a strong commitment to biodiversity conservation. Through continued **plantation efforts and sustainable practices**, the campus fosters an **environmentally conscious academic atmosphere**, promoting both ecological balance and student well-being.

Weather and Climate

K.C. Das Commerce College, located in the heart of Guwahati, experiences a **warm subtropical climate** characterized by **high humidity and significant rainfall**. The **average annual temperature** is approximately **24.0°C**, while the **average annual rainfall** reaches **3038 mm**.

Humidity levels in Guwahati are **relatively high throughout the year**, with **July recording the highest percentage**. Even during the driest months, **relative humidity remains above 55%**, making the climate persistently humid compared to other regions of the country.

Table 3: Monthly weather averages of Guwahati (Temperature in °C, Rainfall in mm, Relative Humidity (RH) in %, Rainy days in number)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Temp	17.6	20.2	23.9	25.1	26.1	27.3	27.5	27.0	27.0	25.3	22.0	18.9
Rain	13.0	26.0	68.0	179.0	323.0	551.0	690.0	618.0	398.0	141.0	21.0	10.0
RH	73.0	65.0	57.0	73.0	83.0	87.0	89.0	88.0	87.0	83.0	76.0	74.0
Rainy Days	2.0	4.0	7.0	14.0	20.0	21.0	21.0	21.0	19.0	11.0	3.0	1.0
Sun hours	7.5	8.8	9.5	7.9	7.8	7.9	8.2	8.3	8.0	8.2	8.3	7.6

Fig. 3: Mean Temperature in different months in Guwahati

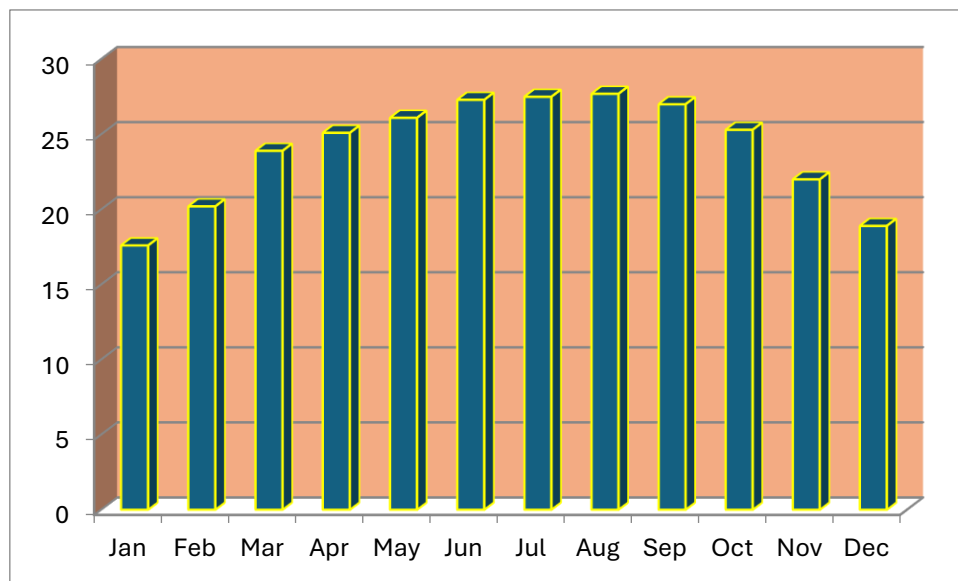
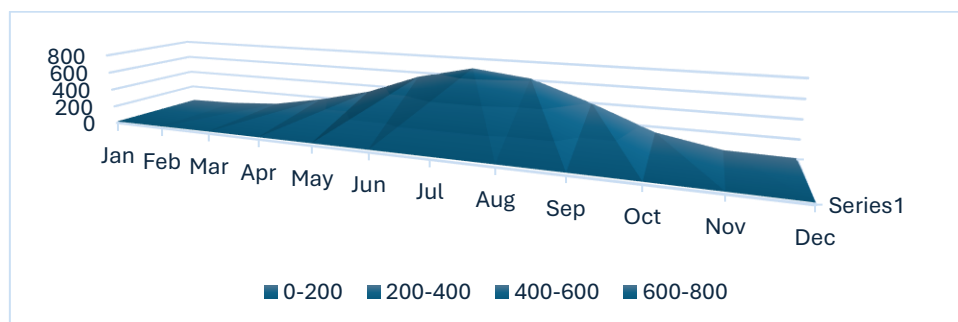


Fig. 4: Mean rainfall month wise in Guwahati



Air Quality

The air quality in Guwahati is classified as unhealthy for sensitive groups, with fine particulate matter (PM_{2.5}) levels exceeding WHO-recommended limits. The average PM_{2.5} concentration is 91 µg/m³, which is more than six times the WHO's safe threshold of 15 µg/m³. PM_{2.5} particles pose significant health risks as they can enter the bloodstream and cause respiratory and cardiovascular issues.

Despite being in the heart of Guwahati's commercial hub, the presence of pollutant-absorbing tree canopies around K.C. Das Commerce College may provide a localized reduction in pollution levels, creating a relatively cleaner microenvironment.

Sources of Air Pollution

- Vehicular emissions
- Open burning of waste
- Construction activities
- Dumping grounds
- Small and medium-scale industrial units

Key Air Quality Indicators

- PM_{2.5} Levels: 91 µg/m³ (6x WHO limit)
- CO Levels: 743 ppb (below WHO's limit of 3490 ppb)
- Annual Air Quality Index (AQI) Trends:
 - Most Polluted Month: March 2021 (AQI 228)
 - Least Polluted Month: August 2022 (AQI 46)
 - 5-Year Trend: 13% deterioration in AQI
 - 2024 Average AQI: 105

Global Air Quality Ranking

According to IQAir's World Air Quality Report, Guwahati is ranked among the most polluted cities globally, with an annual PM_{2.5} concentration of 105.4 µg/m³, exceeding WHO's recommended limit by over 20 times.

Conclusion

While Guwahati faces severe air pollution challenges, green initiatives and afforestation within the college campus can contribute to improving local air quality and promoting a healthier environment for students and faculty.

Water quality

Evaluation of both drinking water and other potable water quality is crucial for identifying contaminants and preventing waterborne diseases. The College has implemented measures to

monitor water quality from time to time, ensuring that drinking water remains safe, clean, and free from harmful bacteria and pollutants. Drinking water in the campus is made available through ‘Aquaguards’ which are under annual maintenance contracts (AMC) with Eureka Forbes. Extracted water from the deep boring well is subjected to two stage filtration firstly through sand and coal and then through iron removal filtration unit before being sent to use for drinking and other purposes. The results of the water quality test serve as clear evidence of the institution’s commitment to safeguarding the health of all stakeholders.

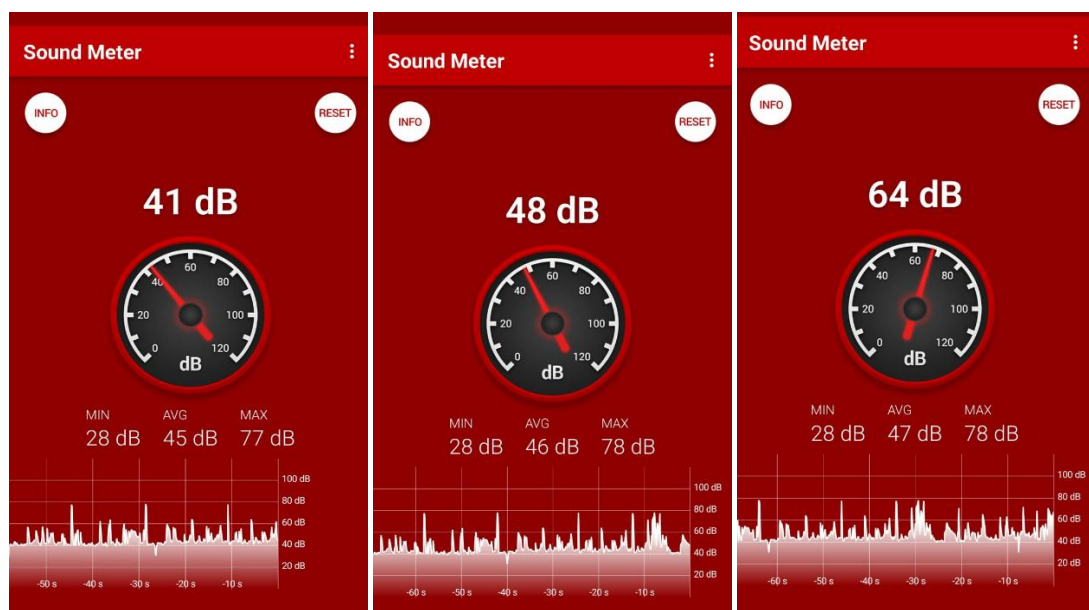
Noise Levels on Campus

A noise-free environment is essential for maintaining a conducive academic atmosphere. Noise, defined as unwanted sound, can cause irritation, impact health, and disrupt the teaching-learning process. According to the World Health Organization (WHO), noise levels above 65 decibels (dB) are classified as noise pollution, while an ideal classroom environment should have noise levels below 35 dB.

Data collected from the campus indicates that noise levels generally remain below 65 dB. During teaching hours, classroom noise levels are close to the ideal range. The campus benefits from its location away from traffic, along with natural barriers such as buildings on the eastern and western boundaries and a vacant marsh on the northern and western sides, which significantly reduce external noise from traffic, construction, and other activities.

Measured Noise Levels:

- Classrooms: 41 dB (range: 28–77 dB)
- Passageways: 48 dB (range: 28–78 dB)
- Open Spaces: 64 dB (range: 28 - 78 dB)



Waste Management at the College

Effective waste management involves systematic handling of waste from its source to final disposal or recycling. The College generates approximately 21 m³ of total waste and follows a structured approach to waste segregation. Every day, waste is separated into degradable and non-degradable categories and disposed of accordingly. To facilitate proper waste disposal, color-coded bins—following Pollution Board guidelines—are placed on each floor of the main buildings (Bld 1, Bld 2, and Bld 3) as well as in the canteen.

Color-Coded Waste Segregation System:

- **Green Bins:** Organic waste, including food scraps, prunings, fruits, and vegetables, for composting, which serves as a soil amendment and nutrient source.
- **Blue Bins:** Paper, cardboard, and other recyclable materials.
- **Red Bins:** Non-recyclable waste such as drinking glassware, broken crockery, cling wrap, plastic bags, packing straps, sticky tape, and glazed wrappers.
- **Yellow Bins:** Glass bottles, newspapers, plastic, used paper, aluminium cans, milk & juice cartons, and disposable coffee cups.

Through the Eco Club's smart initiatives, waste management efforts are enhancing the College's environmental sustainability. Regular awareness campaigns and hands-on activities in Environmental Science classes involve students and faculty, promoting responsible waste management among stakeholders.

To further reduce waste generation, the College actively reuses clean paper and cardboard and refills printer cartridges, contributing to natural resource conservation. Currently, the waste generated on campus is collected and transferred to a community bin which is collected regularly by the Municipal corporation. Additionally, the College has officially declared and aspires to make the entire campus a "Plastic-Free Zone."

Fig. 5: Different coloured bins placed in the college campus



E-Waste Management:

As of now, the College has accumulated the following e-waste:

- CPU: 35
- Monitors: 9
- UPS: 15
- Keyboards: 25
- Mouse: 25
- SMPS (Power Supply Units): 25
- Printers: 8

Computer components are used as teaching tools in the certificate course on Computer Hardware. Lower version PC assembly is tried with functioning parts. Non-usable parts are in the process of safe disposal. SMPS batteries are bought on a buy-back basis from authorized dealers. Printer cartridges are re-cycled or re-filled.

Electrical Power Consumption

The College has a total connected load of 100 kW, with an average annual electricity consumption of 55,315 kWh (units). To promote energy efficiency, the College follows a policy of reducing electricity consumption by systematically replacing outdated filament bulbs and tube lights with LED bulbs and LED tube lights. Additionally, high-power-consuming fans are being replaced with energy-efficient models to further optimize energy use.

The College is equipped with **29 air conditioners: 3 units of 1.0 ton capacity, 20 units of 1.5 ton capacity and 6 units of 2 ton capacity**. However, air conditioning covers only close to 20% of the total built-up area, ensuring controlled and responsible energy usage.

Table 4: Distribution of Air Conditioners in the College

Sl. No	Placement	Name of Company	Ton	Floor	Quantity
1	Library	Blue Star	2	Ground	1
2	E- Resource Center	Voltas	2	1st Floor	1
3	Office	L.G	1.5	Ground	2
4	Conference Hall-1	Blue Star Toner A/C	2	Ground	2
5	Principal Sir's Room	Blue Star	1.5	Ground	1
6	Principal Sir's Room	Voltas	1.5	Ground	1
7	Examination Branch	Blue Star	2	Ground	1
8	Accounts Office	L.G	1.5	Ground	1
9	IQAC Room	Blue Star	2	Ground	1
10	Placement Cell	Blue Star	2	Ground	1

11	Faculty Room	Voltas	1.5	Ground	2
12	IGNOU	Daikin	1.5	1st Floor	1
13	Conference Room-2	Voltas	1.5	1st Floor	4
14	Faculty Room 1st Floor	Voltas	1.5	1st Floor	2
15	IT Center	Voltas	1.5	2nd Floor	2
16	IT Center	Daikin	1	2nd Floor	1
17	M.Com	Samsung	1.5	3rd Floor	1
18	BBA	Blue Star	1.5	3rd Floor	1
19	Value Added Dept.	L.G	1.5	3rd Floor	1
20	Computer Science Dept.	MIDEA	1	3rd Floor	1
21	I.T. R & D Cell	L.G	1.5	4th Floor	1
TOTAL					29

Table 5: Energy consuming appliances fitted/used in the College

Item	Number
Tube light	174
Fans	263
Exhaust	17
Refrigerator	2
Oven	1
AC	29
TV	4
Computer and accessories	111
N computing device with monitor and UPS	10
Projector	13
Scanner	5
Fax	1
Note Counting Machine	2
Barcode Reader Machine	2
Punching Machine	1
Microphone	24
LAN tester	1
Web Camera	1
Water purifier	14 +
Water Heater	1
Water Pump	2
Sanitary Vending Machine & destroyer	4 + 2
Halogen Light	3
Street Light	6

Printer	30
Photostat Machine	8
CCTV	64
Server	3
Smartboards	4
360° Camera	1

Solar Energy Utilization and Energy Conservation

K.C. Das Commerce College has taken a significant step toward sustainability by installing an On-Grid Solar Power System with a 30 kW capacity. This system generates approximately 10,800 kWh annually, helping to offset the college's daytime peak electricity demand from the ASEB connection. With this 30 KW on-grid solar rooftop plant, the College now offsets some of its total energy consumption, contributing to a greener campus and reducing its carbon footprint.

To promote responsible energy use, students are encouraged to minimize electricity wastage, and unnecessary appliance usage is strictly monitored. Posters placed inside and outside classrooms serve as constant reminders to adopt energy-efficient practices.

For further energy optimization, the College is advised to install occupancy sensor lights in common areas and establish minimum and maximum set points for air conditioners to ensure efficient energy use.

Fig. 6: Roof top solar panel, K.C. Das Commerce College



Carbon Footprint Assessment

The carbon footprint of an organization measures the emission of greenhouse gases (primarily CO₂) within its operational boundaries. Regular audits help identify emission sources and develop strategies to minimize their impact.

At K.C. Das Commerce College, the carbon footprint from electricity consumption is estimated at 47.02 metric tons per year. Additionally, transportation-related emissions contribute 1.01 metric tons per year, calculated based on the number of four-wheelers and two-wheelers entering the campus, travel distances within the premises, and the total number of working and class days per year.

Overall, the College's total carbon footprint stands at 48.03 metric tons per year, highlighting the need for continued efforts to reduce emissions and adopt sustainable practices.

Carbon foot print calculation

Electricity: Input value (in KWh/Yr) X 0.85 (Emission Factor) = Output value in (Kg of CO₂)

Petrol: Input Value (In Litres/Yr) X 2.296 (Emission Factor) = Output value in (Kg of CO₂)

Transportation

K.C. Das Commerce College does not provide institutional transportation services; faculty, staff, and students arrange their own commuting methods. Among the 79 employees (both administrative and academic), slightly more than 50% (44 individuals) commute using personal vehicles, with some opting for carpooling. All vehicles possess up-to-date Pollution Under Control (PUC) certifications. The college actively encourages the use of public transportation, bicycles, and electric vehicles (EVs) among its community members. Approximately 5% of students commute via two-wheelers, including a good number who use electric scooters. Notably, students are prohibited from bringing four-wheeled vehicles into the campus.

Ventilation and Exhaust Systems in Buildings

The college ensures that rooms are well-ventilated to maintain optimal internal temperatures, control moisture levels, and eliminate unpleasant odours. Strategically placed exhaust fans further enhance air quality by expelling stale air and introducing fresh air, thereby maintaining a comfortable environment for occupants. Effective ventilation is crucial for promoting health and well-being within educational settings.

Sanitary Pad Vending Machines and Incinerators

Demonstrating a strong commitment to the health and well-being of female students and staff, the college has installed four sanitary napkin incinerators, with at least one located on each floor. Additionally, a sanitary napkin vending machine is installed in the women's restroom for the convenience of female faculty members.

Fig. 7: Sanitary pad vending machine



Water Management Initiatives at K. C. Das Commerce College

K.C. Das Commerce College has implemented several commendable measures to conserve water resources, focusing on rainwater harvesting, efficient water usage, and wastewater management.

Rainwater Harvesting:

The college has established a rainwater harvesting system with a storage capacity of 12.14 m³ (3.66 meters in length, 2.14 meters in width, and 1.55 meters in depth). This system captures and stores rainwater, contributing to water conservation efforts. Additionally, the use of alternate paving blocks in footpaths facilitates water percolation, enhancing groundwater recharge.

Water Supply and Storage:

Potable water is sourced from a recharge bore measuring 6 inches in diameter and 1,080 inches in depth. The collected water is stored in two overhead tanks with capacities of 55.8 cubic meters and 37.2 cubic meters, respectively. On working days, the college's total water requirement is approximately 186 m³.

Utilization of Harvested and Wastewater:

The institution prioritizes the use of harvested rainwater and treated wastewater for cleaning, gardening, and construction activities, thereby reducing reliance on municipal water supplies.

Implementation of Water-Efficient Fixtures:

To promote water conservation, the college has installed efficient fixtures equipped with flow restrictors and dual-flush toilets in select areas. Regular maintenance and prompt repair of

taps, pipes, and other water-related equipment are conducted to prevent leaks and water wastage.

Awareness and Education:

Through policies and campaigns led by the Eco Club and integrated into environmental programs, the college actively promotes responsible water usage among students and staff. These initiatives aim to instill a culture of sustainability within the campus community.

By implementing these comprehensive water management strategies, K.C. Das Commerce College demonstrates its commitment to environmental stewardship and the sustainable use of water resources.

Fire Safety Measures at K.C. Das Commerce College

K.C. Das Commerce College has implemented comprehensive fire safety protocols to ensure the well-being of its students, faculty, and staff.

Fire Extinguishers:

A total of **19** fire extinguishers are strategically installed throughout the campus buildings, spaced approximately 20 to 22 meters apart. This placement aligns with safety guidelines to ensure accessibility in case of emergencies.

Additional Fire Safety Equipment:

In addition to fire extinguishers, sand-filled buckets are positioned near the canteen area to provide an immediate response option for small fires.

Fire Safety Education:

The college places a strong emphasis on fire disaster management education. Students are regularly informed about fire safety protocols and procedures, ensuring they are prepared to respond effectively in the event of a fire emergency. Educational initiatives include:

- Regular fire drills to practice evacuation procedures.
- Workshops and seminars on fire prevention and response strategies.
- Distribution of informational materials highlighting key fire safety practices.

These efforts aim to foster a culture of safety and preparedness within the campus community.

By integrating proper equipment placement with ongoing educational programs, K.C. Das Commerce College demonstrates its commitment to maintaining a safe and secure learning environment.

Fig. 8: Fire extinguisher tool



Accessibility and Safety Measures at K.C. Das Commerce College

K.C. Das Commerce College is dedicated to ensuring a safe and inclusive environment for all students, including those with disabilities. The institution has implemented several measures to enhance accessibility and safety:

- **Anti-Skid Tiles:** To prevent slips and falls, anti-skid tiles have been installed in key areas throughout the campus.
- **Elevator Access:** An elevator is available to facilitate easy movement between floors for students with mobility challenges.
- **Accessible Restrooms:** Separate restroom facilities have been designed to accommodate the needs of students with disabilities, ensuring privacy and convenience.
- **Ramps:** Ramps are strategically placed across the campus to provide barrier-free access to buildings and other facilities.

These initiatives reflect the college's commitment to creating an inclusive and supportive educational environment for all students

Philanthropic Activities

The College conducted following activities generating social responsibility mindset amongst students

Disaster Management and Relief Activities:

Sl. No.	Activity	Agency Involved	Place	Year
1.	Flood Relief Camp	K.C. Das Commerce College Teacher's Unit	Mayong	2016
2.	Flood Relief Camp	K.C. Das Commerce College Health & Hygiene Awareness Cell with NSS Wing of the College	Kamalpur, Athgaon, Changsari	20 th July, 2019
3.	Covid 19 Awareness Camp	K.C. Das Commerce College Health & Hygiene Awareness Cell with NSS Wing of the College	Neighbouring areas of the College	19 th March, 2020
4.	Flood Relief Camp	K.C. Das Commerce College Health & Hygiene Awareness Cell with NCC and NSS Wing of the College	Raha, Nagaon	2022
5.	Disaster Awareness Training Programme	Civil Defence Unit, K. C. Das Commerce College with Civil Defence, Kamrup (M)	College	4 th November, 2023
6.	Disaster Management Mock Drill by Civil Defense	Civil Defence Unit, K. C. Das Commerce College with Civil Defence, Kamrup (M)	College	29 th May, 2024

Some activities involving NCC, NSS, Red Ribbon Club, Eco-Club etc.

- NSS Free Health Checkup Camp at Najirakhat – June 2017
- Red Ribbon Club-Blood donation camp at College campus in collaboration with GMCH on 12th August, 2016.
- K.C. Das Commerce College in association with Deepshikha Foundation Cancer Awareness Walk on 22nd January, 2017.
- Red Ribbon Club Blood Donation Camp in collaboration with Blood Bank, GMCH and nari Shakti Foundation Assam on 8th September, 2017.
- IQAC in collaboration with All Assam Police Association Drug Abuse Awareness Camp cum Health Camp on College campus on 20th June, 2019.
- Red Ribbon Club in collaboration with the Blood Bank Mahendra Mohan Choudhury Hospital and Marwari Yuva Manch Blood Donation Camp in College on 8th September, 2018.

- Red Ribbon Club in collaboration with Blood Bank, Guwahati Medical College & Hospital and Teerapanth Yuva Parishad Blood Donation Camp on 7th September, 2019.
- Red Cross Society, K.C. Das Commerce College participated in Blood Donation Camp at Red Cross Hospital, Chandmari, Guwahati on 21st February, 2021.
- Alumni Association of the College in joint collaboration with JCI Guwahati, organised a Mega Kids Covid Vaccination Camp for children in the age group of 15-18 on 7th & 8th January, 2022.
- NCC Unit, K. C. Das Commerce College, 1 Assam BN NCC, Guwahati in collaboration with Dhirenpara Maternity & Child Welfare Hospital, Govt. of Assam organised a Vaccination Camp on 12th February, 2022.
- Awareness Cell on Health & Hygiene, K. C. Das Commerce College in association with Volunteer for India in Guwahati organised a one day workshop on enhancing the Health, Hygiene and Empowerment of Women in Guwahati City on 24th March, 2022.
- A guest Lecture was organised by the Deptt. of M.Com on Business Ethics on 5th May, 2022.
- As a part of service towards community, K. C. Das Commerce College along with ICICI Bank Ltd. has installed an ATM kiosk within the College campus on 20th May, 2022.
- NCC Cadets of the College along with 1 Assam BN NCC participated in a cycle rally to commemorate World Bicycle Day on 3rd June, 2022.
- Eco-Club, K. C. Das Commerce College organised a Plantation Drive in the campus and an Awareness Drive on Climate Change, Saving Energy and Power for Sustainability on the occasion of World Environment Day on 5th June, 2022.
- A Blood Donation Camp was organised by the Red Ribbon Club of the College in association with Marwari Yuva Manch on 14th June, 2022.
- A Flood Relief Camp was organised at Raha, Nawgaon by the College in association with the NSS Unit, KCDCC Teacher's Unit, NCC Unit, Red Cross Cell and the Community R&D Cell of K. C. Das Commerce College on 29th June, 2022.
- On 21st September, 2022, Department of Economics conducted an awareness programme for the HS Students regarding SDG- 3: Good Health and Well Being and SDG-6: Clean Water and Sanitisation. The students were made aware about the significance of SDGs for betterment of Planet Earth.

- KCDCC NCC Unit participated in the Walk for Bharalu on the occasion of World Rivers' Day, under Save Bharalu Abhiyan on 25th September, 2022.
- A voluntary Blood Donation Camp was organised by the Red Ribbon Club, KCDCC in association with Marwari Yuwa Manch, Greater Guwahati on 4th November, 2022.
- An Awareness Programme on NAsha Mukh Bharat Abhiyan under Kamrup-M District was organised by the District Social Welfare Officers, Kamrup in collaboration with Sadischsa and Literary Forum of K. C. Das Commerce College on 17th March, 2023.
- Swachha Bharat Abhiyan Cleanliness Drive was organised in the Campus and Neighborhood area as a part of NCC Extension service conducted by G Coy, K. C. Das Commerce College NCC Unit on 7th May, 2023.
- On 5th June, 2023 the Eco-Club and NSS Cell of K. C. Das Commerce College conducted a Plantation Drive at Sri Aurobindo Vidya Mandir High School, and a panel discussion was organised in the College campus on the topic Beat Plastic Pollution on the occasion of World Environment Day.
- On the occasion of World Blood Donor Day, the Red Ribbon Club of K. C. Das Commerce College organised a Voluntary Blood Donation Camp in association with Marwari Yuwa Manch on 14th June, 2023.
- As a part of Amrit Brikhya Aandolan, an initiative of Govt. Of Assam, a Plantation Drive was conducted by the Eco-Club of the College on 17th September, 2023 at various spots of the greater neighbourhood.
- A Swachha Bharat Abhiyan Cleanliness Drive was undertaken by the NCC Unit of K. C. Das Commerce College in Programme at the College was conducted by K.C. Das Commerce College Civil Defence Unit in collaboration with Civil Defence, Kamrup Metro District on 4th November, 2023.

