Maulana Mazharul Haque Teachers' Training College
Mathurapur, Samastipur, Bihar

MAULANA MAZHARUL HAQUE TEACHERS' TRAINING COLLEGE

AbuKonsultia INTERNATIONAL

Prepared by
AbuKonsultia International

Green Audit Report

2023-2024

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Acknowledgements

The successful completion of the **Green Audit** for *Maulana Mazharul Haque Teachers' Training College* for the **academic session 2023-2024** is a testament to the collective efforts of various individuals and stakeholders. We extend our sincere gratitude to everyone who contributed their time, expertise, and support in making this initiative a success.

We express our deepest appreciation to the **management and leadership of Maulana Mazharul Haque Teachers' Training College** for their unwavering commitment to environmental sustainability and for facilitating this audit. Their vision and dedication have played a pivotal role in fostering a greener and more eco-conscious campus.

A heartfelt thanks to the **faculty, staff, and students** of MMHTTC, whose enthusiastic participation in surveys, interviews, and data collection enriched the audit with valuable insights. Their commitment to sustainability is truly commendable and serves as an inspiration for the institution's ongoing green initiatives.

We extend our **special gratitude to Mr. Md Abu Sayeed, Secretary, Maulana Mazharul Haque Teachers' Training College**, for his invaluable guidance, encouragement, and continuous support throughout the audit process. His leadership has been instrumental in driving this initiative forward.

We also acknowledge the **Green Audit Team**, whose meticulous planning, thorough evaluations, and professional expertise ensured the accuracy and reliability of this report. Their insightful recommendations provide a clear roadmap for further enhancing the institution's environmental sustainability efforts.

Our sincere thanks to the **National Assessment and Accreditation Council (NAAC)** for establishing comprehensive guidelines that served as the foundation for this audit. Their emphasis on sustainability as a key component of institutional excellence has greatly influenced our approach.

Lastly, we extend our appreciation to all **external stakeholders, community members, and environmental experts** who contributed their knowledge, feedback, and encouragement. Their valuable input has enriched the audit and reinforced the college's commitment to sustainable development.

This report is the outcome of collective dedication, and it reaffirms our shared responsibility towards environmental stewardship. We look forward to continued collaboration in making *Maulana Mazharul Haque Teachers' Training College* a model institution for sustainability and eco-conscious practices.

Disclaimer

This **Green Audit Report** for *Maulana Mazharul Haque Teachers' Training College (MMHTTC)* has been prepared by **AbuKonsultia International** based on data collected and assessments conducted during the **academic session 2023-2024**. While every effort has been made to ensure the accuracy, completeness, and reliability of the information presented herein, the findings and recommendations are subject to the limitations of the data provided, the scope of the audit, and prevailing environmental conditions at the time of assessment.

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MD

AbuKonsultia

Dr. Adil Sultan

Lead Auditor

AbuKonsultia

Green Audit Certificate

This is to certify that a comprehensive Green Audit was conducted at

Maulana Mazharul Haque Teachers' Training College

for the academic session 2023-2024. The audit was carried out in accordance with standard environmental auditing practices and guidelines provided by the National Assessment and Accreditation Council (NAAC).

The Green Audit evaluated the institution's environmental practices and sustainability initiatives across key areas, including – Renewable energy utilization, Waste management & recycling, Water conservation practices, Biodiversity & green space management, Carbon footprint reduction initiatives, and Environmental education & awareness.

The audit findings reflect Maulana Mazharul Haque Teachers' Training College's commitment to fostering an environmentally sustainable and resource-efficient campus. The institution has demonstrated significant progress in implementing green practices while identifying areas for further enhancement.

The audit team commends Maulana Mazharul Haque Teachers' Training College for its proactive approach to environmental stewardship and its dedication to aligning institutional values with sustainability goals. Recommendations have been provided to guide future improvements and ensure continued progress toward a greener campus.

This certificate acknowledges the successful completion of the Green Audit and encourages Maulana Mazharul Haque Teachers' Training College to maintain and enhance its sustainability initiatives, serving as a model institution for environmental responsibility.

Mr. Md. Asif Iqbal	**Mrs. Shamza Alam**	**Dr. Adil Sultan**
Auditor	Auditor	Lead Auditor

Executive Summary

Maulana Mazharul Haque Teacher's Training College (MMHTTC) conducted the Green Audit for the academic session 2023-2024 to evaluate its environmental practices, assess resource usage, and improve sustainability initiatives. This audit reflects the college's dedication to cultivating a green campus and adhering to the National Assessment and Accreditation Council (NAAC) guidelines, which emphasize environmental awareness and sustainable institutional practices.

KEY FINDINGS

ENERGY MANAGEMENT:

- The campus generates 30% of its energy through solar panels, reducing its reliance on non-renewable energy sources.
- The adoption of energy-efficient systems, including LED lighting and smart meters, has led to a 10% decrease in total energy consumption.

WATER CONSERVATION:

- The rainwater harvesting systems on campus capture around 60,000 liters of water each year.
- The installation of water-saving fixtures has resulted in a 20% reduction in overall water consumption.

WASTE MANAGEMENT:

- Waste segregation on campus is at 70%, with half of the segregated waste being successfully recycled.
- E-waste management is still in the initial phase and needs enhanced collaborations for proper and eco-friendly disposal.

CARBON FOOTPRINT REDUCTION:

- The college has successfully planted 500 trees through tree plantation drives, helping to offset approximately 5 metric tons of CO2 each year.
- Sustainable transportation efforts, including carpooling incentives, bike lanes, and electric vehicle charging stations, have contributed to a 5% reduction in emissions from transportation activities.

GREEN SPACES AND BIODIVERSITY:

- The college maintains over 1,000 square meters of green spaces, which host 40 native plant species and contribute to the enhancement of campus biodiversity.

Executive Summary

KEY FINDINGS

ENVIRONMENTAL EDUCATION AND AWARENESS:

- Sustainability workshops and seminars have reached 80 percent of students, promoting eco-consciousness within the academic community.
- Environmental responsibility is reinforced through the integration of sustainability modules into the curriculum.

KEY STRENGTHS

- ✓ Strong adoption of renewable energy through solar panels.
- ✓ Effective water conservation strategies, such as rainwater harvesting and the use of water-saving fixtures.
- ✓ Well-maintained green spaces and significant efforts in biodiversity conservation.

AREAS FOR IMPROVEMENT

- ✓ Expand renewable energy use by incorporating wind and hybrid systems.
- ✓ Strengthen waste management practices, particularly in handling hazardous and e-waste.
- ✓ Increase the scale and frequency of environmental education programs.

RECOMMENDATIONS

 Renewable Energy: Expand solar panel installations and explore additional renewable energy sources, such as wind power and hybrid systems.

 Waste Management: Introduce a more comprehensive recycling program and form partnerships with local organizations for responsible e-waste disposal.

 Water Efficiency: Increase rainwater harvesting capacity and implement greywater recycling systems to further reduce water consumption.

 Carbon Offset: Organize larger-scale tree plantation drives and explore other innovative programs to offset carbon emissions.

 Environmental Education: Integrate sustainability modules across various disciplines and encourage student-led green initiatives to further promote environmental consciousness.

Executive Summary

The Green Audit of Maulana Mazharul Haque Teacher's Training College (MMHTTC) showcases the institution's strong commitment to sustainability and its ongoing efforts to reduce environmental impact. The findings highlight significant achievements, such as the adoption of renewable energy and water conservation practices, while also identifying key areas for further improvement. By acting on the recommendations provided, MMHTTC has the opportunity to refine its practices, enhance resource management, and solidify its position as a model of sustainable development in the education sector.

This executive summary reflects the core observations and proposed strategies, laying a clear pathway for MMHTTC to continue advancing its environmental initiatives and ensuring a sustainable future for its campus and community.

1. Introduction

Environmental sustainability has become a crucial aspect of institutional governance, particularly in educational institutions that play a pivotal role in shaping eco-conscious attitudes and sustainable practices. *Maulana Mazharul Haque Teachers' Training College (MMHTTC)*, recognizing its responsibility towards environmental stewardship, has undertaken a **Green Audit** for the academic year **2023-2024**. This audit serves as a comprehensive assessment of the institution's environmental policies, resource utilization, and sustainability initiatives, aligning with the broader objectives of sustainable development.

The **Green Audit** is a structured process that evaluates MMHTTC's environmental performance across key parameters, including **energy efficiency, waste management, water conservation, carbon footprint assessment, and green infrastructure development**. The audit aligns with the **National Assessment and Accreditation Council (NAAC) guidelines**, which emphasize the integration of sustainability within institutional operations, governance, and academic curricula. By conducting this assessment, MMHTTC aims to strengthen its commitment to sustainability and environmental best practices.

This audit serves multiple purposes:

- **Identifying institutional strengths** in environmental sustainability.
- **Highlighting areas for improvement** to minimize ecological impact.
- **Developing actionable strategies** to enhance resource efficiency and sustainable practices.
- **Engaging faculty, staff, and students** in environmental conservation efforts to foster a culture of sustainability.

MMHTTC has already demonstrated its commitment to environmental responsibility through initiatives such as **renewable energy adoption, afforestation programs, and waste management systems**. The findings of this audit will further guide the institution in implementing innovative, eco-friendly solutions and reinforcing environmental education within its curriculum.

By addressing the recommendations outlined in this report, *Maulana Mazharul Haque Teachers' Training College* aspires to establish itself as a leader in sustainable education. This initiative not only reflects the institution's achievements but also serves as a **roadmap for future sustainability efforts**, contributing to a greener and more resilient academic environment.

1.1 Concept and Background

1.1.1 Concept of Green Audit

A Green Audit is a structured and systematic evaluation of an institution's environmental performance, designed to assess how effectively natural resources are managed, identify areas for improvement, and recommend sustainable strategies. As a diagnostic tool, it enables organizations to integrate eco-friendly practices into their operational framework, contributing to long-term environmental sustainability. The growing urgency to address global challenges such as climate change, resource depletion, and pollution has reinforced the importance of Green Audits, making them an essential component of responsible governance.

For educational institutions, Green Audits hold particular significance, as they not only enhance institutional sustainability but also serve as a platform for environmental education and awareness. These audits typically focus on key parameters such as:

- Energy efficiency and renewable energy integration.
- Waste management, including reduction, segregation, and recycling.
- Water conservation through rainwater harvesting and efficient usage.
- Biodiversity conservation and afforestation initiatives.
- Carbon footprint assessment and reduction strategies.
- Sustainable infrastructure development and eco-friendly campus planning.

By analyzing these aspects, institutions can establish a baseline for their environmental impact, set measurable sustainability goals, and track progress over time. Additionally, Green Audits align with national and international sustainability frameworks, including the National Assessment and Accreditation Council (NAAC) guidelines in India, which emphasize environmental responsibility as a key factor in educational accreditation.

1.1.2 Background of the Green Audit

Maulana Mazharul Haque Teachers' Training College (MMHTTC) has consistently demonstrated its commitment to sustainability by embedding eco-conscious practices within its institutional framework. Recognizing the critical role of

including the National Assessment and

educational institutions in addressing environmental challenges, MMHTTC has undertaken a Green Audit for the academic year 2023-2024 as part of its strategic efforts to enhance sustainability and promote environmental responsibility.

This initiative reflects the college's dedication to integrating sustainability into its core values, fostering an environmentally responsible culture among students, faculty, and staff. Over the years, MMHTTC has actively implemented several green initiatives, including:

- Adoption of solar energy to reduce dependency on conventional power sources.
- Waste segregation and recycling programs for effective waste management.
- Rainwater harvesting systems to optimize water conservation.
- Afforestation and tree plantation drives to enhance biodiversity and carbon sequestration.

These efforts have significantly reduced the institution's ecological footprint, contributing to a healthier, greener, and more sustainable campus environment.

The Green Audit of MMHTTC is designed to provide a comprehensive evaluation of the college's environmental sustainability practices, identifying both existing strengths and areas for innovation and improvement. Furthermore, the audit aligns with NAAC's emphasis on sustainability, reinforcing MMHTTC's commitment to excellence in environmental governance and ensuring compliance with national regulatory frameworks.

In this context, the Green Audit serves as:

- A reflection of MMHTTC's sustainability achievements and ongoing green initiatives.
- A blueprint for future improvements, ensuring continuous progress in environmental performance.
- A model for other educational institutions, setting a benchmark in sustainable campus management.

This audit also underscores the importance of stakeholder engagement, encouraging active participation from students, faculty, staff, and the wider community in the collective journey toward sustainability. By addressing the audit's findings and recommendations,

MMHTTC aims to not only enhance its environmental performance but also contribute to global sustainability efforts, positioning itself as a leader in environmentally responsible education.

As environmental challenges continue to evolve, MMHTTC's commitment to sustainability is both timely and essential, equipping the institution and its stakeholders with the knowledge, practices, and infrastructure necessary to contribute meaningfully to a greener and more resilient future.

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1.2 Overview of College

Maulana Mazharul Haque Teachers' Training College (MMHTTC), established in 2010 by the Maulana Mazharul Haque Welfare Society, is a premier co-educational institution located in Mathurapur, Samastipur, Bihar. Affiliated with Lalit Narayan Mithila University (LNMU), Darbhanga, and recognized by the National Council for Teacher Education (NCTE), Bhubaneswar, MMHTTC has become a distinguished institution in the field of teacher education, consistently contributing to the development of competent educators.

MMHTTC offers two flagship programs: the Bachelor of Education (B.Ed.) and the Diploma in Elementary Education (D.El.Ed.), both designed to align with the regulatory standards of NCTE and the academic guidelines set by the affiliated university. The institution emphasizes not only academic excellence but also the importance of social responsibility and environmental sustainability. MMHTTC has earned a B+ grade accreditation from NAAC, underscoring its commitment to high academic standards and institutional quality.

Vision

The vision of MMHTTC is to become a dynamic center of teacher education, fostering a culture of innovation, inclusivity, and academic excellence. The institution aims to equip educators with modern teaching methodologies, technological proficiency, and a deep commitment to social development. MMHTTC aspires to be a pioneer in the field of education, producing teachers capable of generating new ideas, promoting human values, and contributing to national development.

Mission

The mission of MMHTTC is to create an enriched learning environment that enhances teacher competencies through resourceful and innovative education. The college focuses on:

- Empowering students with professional skills and ethical values.
- Promoting research-driven learning and interdisciplinary teaching methodologies.
- Ensuring excellence in teacher education through curriculum enhancement and faculty development.
- Encouraging students to be socially responsible educators who contribute to national and global educational standards.

1.3 Academic Programs

MMHTTC offers two flagship programs in teacher education, aligned with NCTE regulations and university guidelines:

1.3.1 Bachelor of Education (B.Ed.)

The B.Ed. program is designed to prepare students for secondary and higher secondary school teaching. The curriculum includes:

- Educational psychology and pedagogical training.
- 120-day supervised teaching practice in schools.
- Integration of digital learning tools and classroom innovations.

1.3.2 Diploma in Elementary Education (D.El.Ed.)

The D.El.Ed. program focuses on primary school education, equipping students with:

- Foundational knowledge in child development and instructional strategies.
- Hands-on experience through fieldwork and practical training.
- Exposure to modern teaching-learning techniques.

MMHTTC also offers certificate courses to enhance students' skills in ICT, language proficiency, and specialized pedagogy.

1.4 Campus Infrastructure and Facilities

1.4.1 Learning and Teaching Facilities

The MMHTTC campus spans 4058 square meters, offering a modern, well-equipped environment for teaching and learning. Facilities include:

- 12 spacious classrooms with audio-visual teaching aids.
- A fully digitized library with 7709 books, 200 reference materials, 168 journals, and access to e-resources.
- ICT-enabled classrooms and computer labs for digital learning.
- A multi-purpose seminar hall with multimedia facilities.
- A psychology lab, arts and crafts resource center, and language lab to support hands-on teacher training.

1.4.2 Student Support and Services

- A dedicated Career Guidance and Counselling Cell, offering career coaching and competitive exam preparation (CTET, STET, UPSC).
- Annual Personality Development and Life Skills training programs with industry experts .
- Wi-Fi-enabled campus with 200 Mbps high-speed internet access.
- Separate common rooms for male and female students.
- A canteen, parking facilities, and a faculty lounge.

1.4.3 Environmental and Social Responsibility Initiatives

- A Green Campus Initiative focusing on sustainable practices.
- Rainwater harvesting and waste management programs.
- Community outreach through literacy campaigns and vocational training in rural areas.

1.5 Quality Assurance and Continuous Improvement

MMHTTC is committed to academic quality enhancement through:

- Regular academic audits to evaluate teaching effectiveness, curriculum alignment, and institutional governance
- . Faculty development programs, ensuring continuous professional growth and research engagement.

Table 1.1 General Information about the College

General Information about the college						
S. No.	**Particulars**	**Fact**				
1	Name of the College And code given by the NCTE	Maulana Mazharul Haque Teachers' Training College				
2	College Address	Mathurapur, Samastipur (Bihar), Pin- 848101				
3	Whether the College is accredited by the NAAC	Yes				
		If Yes, Grade- B+				
4	Year of establishment	2010				
5	Current programs offered by the institution	B.Ed.				
6	Whether there are other Courses offered in the same building	Yes, D.El.Ed.				
7	**General Facilities of the college**					
	S. No.	**Particular**	**Total**	**S. No.**	**Particular**	**Total**
	i	Class Room	12	ii	Multi-purpose Hall	01
	iii	Library cum Reading Area	01	iv	ICT Room	01
	v	Teaching Learning Resource Centre for Arts & Work Experience	01	vi	Health & Physical Education Resource Centre	01
	vii	Principal Office	01	viii	Administrative Office	01
	ix	Girls Common Room	01	x	Boys Common Room	01
	xi	Conference Room	01	xii	Canteen	01
	xiii	Toilet (Male)	16	xiv	Toilet (Female)	06
	xv	Urinal (Male)	03	xvi	Urinal (Female)	02
	xvii	Pantry	01	xviii	HoD Room	01
	xix	Psychology Lab	01	xx	No. of Lab	04
	xxi	Store Room	02	xxii	Examination Cell	01
	xxiii	Curriculum Lab	01	xiv	Arts and craft Resource Centre	01
	xv	Staff Room	01	xvi	Parking	01

1.6 Goals and Objectives

1.6.1 Goals of the Green Audit

The primary goal of the Green Audit at Maulana Mazharul Haque Teacher's Training College (MMHTTC) is to ensure that the institution operates in an environmentally responsible, resource-efficient, and ecologically sustainable manner. Through a thorough evaluation of the college's environmental practices, the Green Audit aims to seamlessly integrate sustainability into MMHTTC's operations, academic programs, and community outreach efforts.

The specific goals of the Green Audit include:

a) **Promoting Environmental Awareness**: To foster a culture of environmental consciousness and responsibility among students, faculty, staff, and stakeholders, encouraging active participation in sustainability efforts.

b) **Optimizing Resource Usage**: To enhance the efficiency of energy, water, and other natural resources by identifying areas for conservation and waste reduction.

c) **Encouraging Sustainable Practices**: To incorporate green initiatives such as renewable energy usage, sustainable transportation options, waste segregation, and biodiversity conservation within the operational structure of the college.

d) **Strengthening Campus Sustainability**: To transform MMHTTC into a leading example of a sustainable campus by upgrading infrastructure, expanding green spaces, and adopting innovative sustainability solutions.

e) **Minimizing Environmental Footprint**: To reduce the college's ecological impact by addressing carbon emissions, waste, and resource inefficiencies.

f) **Ensuring Compliance with Environmental Standards**: To align the college's operations with national and international environmental guidelines, including those established by the National Assessment and Accreditation Council (NAAC), ensuring transparency and accountability.

g) **Building a Framework for Ongoing Sustainability**: To implement a system for continuous monitoring, evaluation, and reporting of environmental practices, enabling the setting of measurable sustainability targets.

h) **Positioning MMHTTC as a Sustainability Leader**: To establish the college as a benchmark institution in the education sector for sustainability, inspiring other educational institutions to adopt similar practices.

By accomplishing these goals, the Green Audit supports MMHTTC's vision of becoming a responsible institution, educating future leaders while setting an example for sustainable practices in the education sector.

1.6.2 Objectives of the Green Audit

The primary objective of the Green Audit is to assess and improve the environmental performance of Maulana Mazharul Haque Teacher's Training College (MMHTTC), ensuring adherence to sustainable practices and minimizing its ecological footprint. This audit systematically evaluates the college's resource use, waste management, and environmental initiatives, aiming to identify strengths, areas for improvement, and recommend actionable strategies to meet sustainability goals.

Key objectives of the Green Audit include:

a) **Evaluation of Environmental Practices**: Review the college's existing environmental policies, practices, and infrastructure to assess their effectiveness in promoting sustainability.

b) **Resource Utilization Optimization**: Analyze the consumption of key resources such as energy, water, and raw materials to find opportunities for resource conservation, efficiency improvements, and waste reduction.

c) **Waste Management Review**: Examine the college's waste management systems, including segregation, recycling, and disposal practices, to ensure alignment with sustainable waste management principles.

d) **Carbon Footprint Assessment**: Measure the college's carbon footprint and suggest methods for reducing emissions, such as increasing the use of renewable energy, implementing tree plantation programs, and encouraging sustainable transport practices.

e) **Biodiversity Assessment**: Evaluate the status of the campus's green spaces and biodiversity and provide recommendations to enhance and preserve native plant and animal species.

f) **Sustainability Integration in Curriculum**: Advocate for the integration of sustainability concepts into academic programs and extracurricular activities to raise awareness and foster eco-conscious behavior among students and staff.

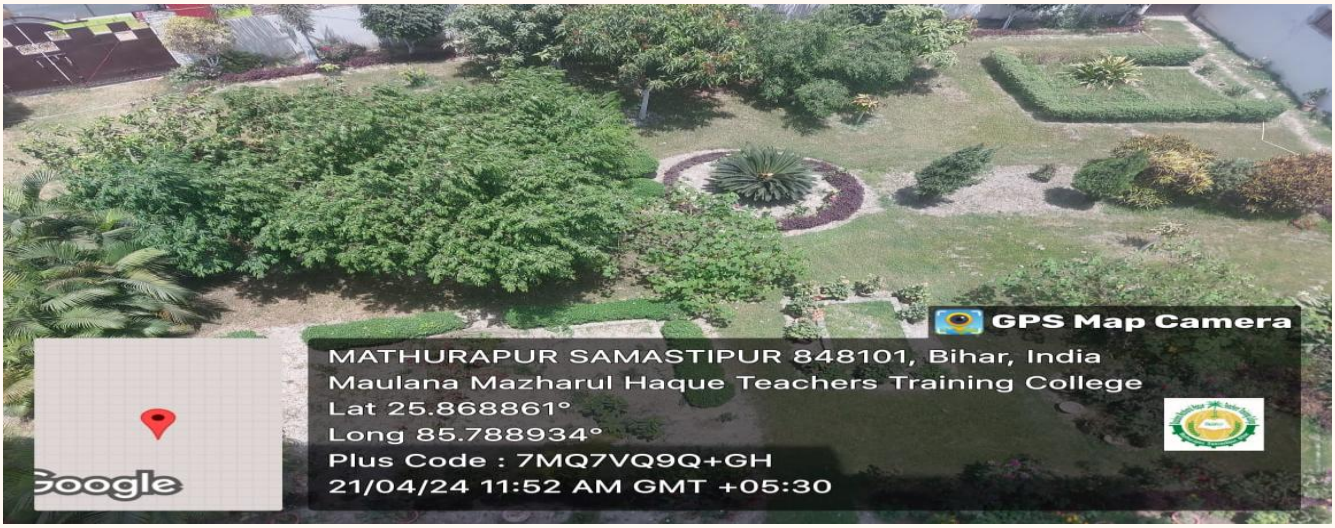
g) **Environmental Standards Compliance**: Ensure that MMHTTC's environmental practices meet local, national, and international environmental standards, including the guidelines established by the National Assessment and Accreditation Council (NAAC).

h) **Engagement of Stakeholders**: Encourage active participation from students, faculty, and staff in sustainability initiatives, nurturing a culture of environmental responsibility across the campus.

i) **Continuous Improvement Framework**: Develop a system for regular monitoring and reporting of environmental performance, allowing the college to set achievable sustainability targets and track progress over time.

j) **Benchmarking for Sustainability Leadership**: Position MMHTTC as a leader in sustainability within the education sector, setting a benchmark for best practices in environmental management.

Through these objectives, the Green Audit aims to further MMHTTC's commitment to sustainability, drive positive change within the academic community, and contribute to global environmental efforts.



1.7 Methodology of Green Audit

The Green Audit of Maulana Mazharul Haque Teacher's Training College (MMHTTC) is a systematic and comprehensive process designed to assess the college's environmental practices and sustainability efforts. The audit methodology is aligned with the guidelines of the National Assessment and Accreditation Council (NAAC), which emphasizes environmental sustainability as a critical component of institutional excellence. The approach follows a structured framework that evaluates energy management, waste handling, water conservation, biodiversity, carbon footprint, and other green initiatives, while identifying areas for improvement and proposing actionable recommendations for greater sustainability.

1.7.1 Key Steps in Methodology

1.7.1.1 Planning and Scoping

- **Objective Setting**: Clearly define the objectives of the Green Audit, ensuring they align with MMHTTC's sustainability goals. Focus areas include energy efficiency, waste management, water conservation, biodiversity, carbon footprint, and green initiatives.
- **Framework Design**: Develop an audit framework in line with NAAC's Criteria 7: Institutional Values and Best Practices, ensuring that the methodology addresses the relevant environmental indicators.

1.7.1.2 Data Collection

- **On-site Assessment**: Perform physical inspections of campus facilities such as classrooms, laboratories, green spaces, and infrastructure to collect data on energy consumption, water usage, waste generation, and biodiversity.
- **Stakeholder Surveys**: Distribute questionnaires and conduct interviews with students, faculty, and staff to gather insights on their perceptions, practices, and involvement in sustainability efforts.
- **Document Review**: Review existing policies, operational records, maintenance logs, energy bills, waste disposal contracts, water usage reports, and other environmental program documents to assess the college's current practices.

1.7.1.3 Data Analysis

- **Resource Utilization Assessment**: Evaluate energy consumption patterns, water usage trends, and waste production levels to identify opportunities for resource conservation and efficiency improvements.
- **Environmental Impact Evaluation**: Measure the institution's carbon footprint, assess biodiversity levels, and analyze the effectiveness of current green initiatives using both quantitative and qualitative methods.
- **Compliance Review**: Evaluate MMHTTC's adherence to relevant local, national, and international environmental regulations and NAAC standards related to sustainability and environmental responsibility.

1.7.1.4 Benchmarking and Best Practices

- **Comparison with Standards**: Compare MMHTTC's environmental performance against established national sustainability benchmarks and the guidelines provided by NAAC, as well as practices of peer institutions.
- **Identification of Best Practices**: Highlight successful green initiatives within the institution, such as renewable energy implementation, eco-friendly infrastructure, and sustainability-focused educational programs, which align with NAAC's sustainability requirements.

1.7.1.5 Reporting and Recommendations

- **Findings Summary**: Prepare a detailed report that outlines the strengths, weaknesses, and opportunities identified during the audit. This will serve as a foundation for future sustainability strategies.
- **Recommendations**: Offer practical and actionable recommendations for enhancing MMHTTC's sustainability practices. These may include strategies for resource optimization, waste reduction, biodiversity preservation, and promoting environmental awareness.

1.7.1.6 Monitoring and Follow-Up

- **Implementation Support**: Assist MMHTTC in integrating the audit's recommendations into the college's strategic and operational planning.

- **Progress Tracking**: Establish key performance indicators (KPIs) to track the progress of sustainability goals and assess ongoing environmental performance.
- **Periodic Reviews**: Conduct follow-up audits at regular intervals to ensure continuous improvement and sustained progress toward meeting sustainability objectives.

1.7.1.7 Integration with NAAC Criteria

The Green Audit methodology is designed to directly address NAAC's **Criterion 7: Institutional Values and Best Practices**, which includes the following key areas:

- **Environmental Consciousness and Sustainability**:
    - Measures for energy efficiency and renewable energy use.
    - Adoption of sustainable waste management practices.
    - Efforts for water conservation and biodiversity enhancement.
- **Best Practices**:
    - Documenting and promoting innovative green practices that can set a benchmark for other institutions to follow.
- **Institutional Distinctiveness**:
    - Demonstrating leadership in environmental stewardship through impactful sustainability initiatives that contribute to institutional identity and environmental responsibility.

1.7.1.8 Outcomes of the Green Audit Methodology

By following this methodology, MMHTTC ensures the following outcomes:

- **Comprehensive Evaluation**: A thorough evaluation of the college's current environmental practices, identifying strengths and areas for improvement.
- **Enhanced NAAC Compliance**: Improved alignment with NAAC's accreditation standards, particularly in the areas of environmental consciousness and best practices.

- **Clear Sustainability Roadmap**: Development of a roadmap for sustainability improvement, with clear, actionable steps for advancing green practices.
- **Campus-wide Engagement**: Increased engagement of students, faculty, and staff in sustainability efforts, fostering a campus culture of environmental responsibility.
- **Sustainability Leadership**: Establishing MMHTTC as a model institution for sustainable practices within the education sector, setting an example for other institutions to follow.

This structured approach not only ensures compliance with NAAC guidelines but also strengthens MMHTTC's commitment to creating a sustainable, eco-conscious campus that leads by example in environmental stewardship.

2. Green Audit Analysis

2.1 General Information

Table 2.1: General Information (Questionnaire Based Answers)

2.1.1: Was any Green Audit conducted earlier?			
Yes, (2022-23)			
2.1.2: What is total strength of the college			
Population	Male	Female	Total
Students	253	147	400
Teaching Staff	17	12	29
Non-teaching Staff	09	02	11
Total	279	161	444
2.1.3: What is total number of working days of your college in a year?			
There are two hundred fifty-two (252) working days in the college.			
2.1.4: Where is the college located?			
The campus is located at Mathurapur, Samastipur Bihar – 848102			
2.1.5: Which of the following area available in your college?			
• Garden area			✓ **YES**
• Play ground			✓ **YES**
• Kitchen			✓ **YES**
• Toilets			✓ **YES**
• Garbage or Waste Store Yard			✓ **YES**
• Laboratory			✓ **YES**
• Canteen			✓ **YES**
• Hostel Facility			✓ **YES**
• Guest House			✓ **YES**

2.2 Waste Management

Effective waste management serves as a fundamental pillar of environmental sustainability, particularly within educational institutions where various activities contribute to diverse waste streams. At **Maulana Mazharul Haque Teacher's Training College (MMHTTC)**, the commitment to environmental responsibility is reflected in a structured, scientific, and sustainable approach to managing waste across the campus. The institution recognizes that effective waste management not only minimizes its ecological footprint but also fosters awareness and responsibility among students, faculty, and staff, promoting a culture of environmental stewardship. By implementing systematic waste management strategies, MMHTTC aligns its sustainability efforts with the principles of the **National Assessment and Accreditation Council (NAAC)** and broader environmental conservation frameworks.

2.2.1 Significance of Waste Management in Educational Institutions

Educational institutions function as microcosms of society, generating waste from **academic, administrative, residential, and extracurricular** activities. Without proper management, improper waste disposal can lead to severe **environmental degradation, public health risks, and loss of recyclable resources**. In contrast, a well-designed and efficiently implemented waste management system has several benefits, including:

- **Reduction of the campus's carbon footprint** by diverting waste from landfills and encouraging recycling.
- **Conservation of natural resources** through systematic segregation and recycling initiatives.
- **Mitigation of health hazards** arising from unmanaged waste, particularly hazardous and biomedical waste.
- **Promotion of environmental consciousness** among students and staff, instilling responsible waste disposal habits.
- **Enhancement of institutional sustainability rankings**, contributing to the institution's compliance with national and international accreditation standards.

In recognition of these factors, **MMHTTC has adopted a multi-faceted waste management approach**, integrating modern waste disposal techniques, recycling mechanisms, and awareness programs to ensure that its waste footprint is minimized while maximizing resource recovery.

2.2.2 Types of Waste Generated at MMHTTC

Due to its multidisciplinary activities, infrastructural developments, and operational dynamics, MMHTTC generates a diverse range of waste. The institution categorizes waste into several distinct streams to facilitate effective management:

Types of Waste Generated at MMHTTC

1. Paper Waste

- **Sources**: Administrative offices, classrooms, libraries, and research departments.
- **Examples**: Discarded documents, notebooks, newspapers, examination scripts, and outdated records.
- Management Strategy: Recycling through paper shredding and composting or repurposing for academic and administrative reuse.

2. Plastic Waste

- **Sources**: Cafeterias, student events, daily operations.
- **Examples**: Single-use plastics such as disposable water bottles, food containers, polythene bags, and packaging materials.
- **Management Strategy**: Strict plastic-use reduction policy, with recycling initiatives and promotion of eco-friendly alternatives.

3. Food Waste

- Sources: College dining halls, cafeterias, and hostel kitchens.
- Examples: Leftovers, food scraps, expired food products.
- Management Strategy: Composting food waste into organic manure for landscaping and green cover enhancement.

4. Electronic Waste (E-Waste)

- Sources: Academic departments, administrative offices, ICT centers.
- Examples: Obsolete or damaged computers, printers, monitors, peripherals, batteries, and circuit boards.
- Management Strategy: E-waste collection points for responsible recycling through authorized vendors.

5. Metal Waste

- Sources: Canteens, packaging materials, laboratory activities.
- Examples: Aluminum cans, metal scraps, steel packaging.
- Management Strategy: Segregation at source, recycling through metal-processing units.

6. Glass Waste

- Sources: Laboratories, beverage consumption, construction projects.
- Examples: Broken glass, jars, laboratory glassware.
- Management Strategy: Safe handling procedures and specialized recycling in collaboration with waste management authorities.

7. Organic Waste

- Sources: Landscaping, tree pruning, fallen leaves.
- Examples: Garden trimmings, biodegradable campus waste.
- Management Strategy: Vermicomposting and organic manure production for campus gardening and agriculture.

8. Non-Biodegradable Waste

- Sources: Plastic, synthetic materials, composite waste.
- Examples: Plastics, non-recyclable wrappers, Styrofoam.
- Management Strategy: Municipal disposal and incineration partnerships for safe processing.

9. Hazardous Waste

- Sources: Science laboratories, maintenance workshops.
- Examples: Chemical solvents, laboratory waste, expired reagents.
- Management Strategy: Specialized disposal following governmental environmental regulations.

10. Special Events Waste

- Sources: Conferences, seminars, cultural programs.
- Examples: Disposable cutlery, promotional banners, decorations.
- Management Strategy: Sustainable event management guidelines to minimize waste and encourage reusable materials.

11. Construction and Demolition Waste

- Sources: Infrastructure development, renovation projects.
- Examples: Concrete debris, wood, scrap metal.
- Management Strategy: Reuse of salvageable materials, and proper disposal of non-recyclable debris.

2.2.3 Objectives of Waste Management at MMHTTC

The college's waste management policy is guided by a set of **strategic objectives** aimed at fostering sustainability and compliance with environmental standards:

1. **Minimize waste generation** through awareness programs, waste audits, and institutional policies.
2. **Segregate waste at source** to facilitate efficient recycling and disposal.
3. **Promote composting and organic waste recycling** to enhance campus greenery.
4. **Ensure safe and eco-friendly disposal of e-waste and hazardous waste** in collaboration with certified agencies.
5. **Establish a zero-waste campus culture** through education, workshops, and participatory programs.

2.2.4 Scientific Approach and Institutional Commitment

MMHTTC has adopted a **scientific and systematic** waste management framework. The **key components** of this approach include:

- **Waste Audits**: Regular **quantitative and qualitative assessments** of waste generation, identifying areas for reduction and optimization.
- **Vermicomposting Facilities**: Utilization of biodegradable waste to create organic manure, enhancing the **campus's green initiatives**.
- **Recycling Mechanisms**: Collaboration with **municipal and private recycling units** to process **paper, plastic, metal, and glass** waste.
- **E-Waste Management Partnerships**: Authorized **electronic waste disposal agencies** ensure the safe and sustainable handling of obsolete technology.
- **Waste Segregation Units**: **Color-coded bins** placed strategically across campus for **biodegradable, non-biodegradable, and hazardous waste**.
- **Awareness and Training**: Regular **workshops, campaigns, and seminars** on sustainable waste management, **integrated into student projects and coursework**.
- **Green Campus Initiatives**: Policies promoting **paperless administration, digital classrooms, and eco-friendly alternatives** to reduce waste at the source.

By prioritizing **waste reduction, recycling, and responsible disposal**, MMHTTC is setting a benchmark for **environmental leadership** in the education sector. This initiative is a reflection of the college's **broader vision to harmonize academic excellence with ecological responsibility**, paving the way for a **greener, healthier, and more sustainable future**.

🌿 2.3 Waste Management at MMHTTC

2.3.1: Does your college generate any waste? If so, what are they?

Yes, the college generates the following types of waste:

🏷 Type of Waste	📌 Description
📄 **Solid Waste**	📝 **Paper Waste**: Old notebooks, documents, examination papers, newspapers. 🍽 **Canteen Waste**: Food leftovers, disposable utensils, packaging. 🛍 **Plastic Waste**: Packaging materials, single-use plastics, stationery waste.
🌱 **Biodegradable Waste**	🍂 Organic waste, including **fallen leaves, garden trimmings, and food waste** from the canteen.
♻ **Non-Biodegradable Waste**	🏭 **Plastics, metals, and glass** from campus activities.
💻 **E-Waste**	🔋 Obsolete or damaged **electronic items**, including **computers, printers, cables, and batteries**.
✅ **Waste Management Approach**	🏫 MMHTTC follows a **structured waste management policy** ensuring responsible **segregation, recycling, and disposal**.

📊 2.3.2: Approximate Amount of Waste Generated

♻ Category	⚖ Waste Generated (Per Day)
🗑 **Solid Waste**	28 kg/day
🍃 **Biodegradable Waste**	19 kg/day
🚫 **Non-Biodegradable Waste**	7 kg/day
💾 **E-Waste**	0.2 kg/day

🔄 2.3.3: How Much Solid Waste is Recycled Daily?

🔄 Waste Type	♻️ Recycled Daily
🗑️ **Solid Waste**	12 kg/day

🚮 2.3.4: How Much Solid Waste is Disposed of Daily?

🚮 Waste Type	🗑️ Disposed Daily
🗑️ **Solid Waste**	28 kg/day

♻️ 2.3.5: How is the Waste Managed on Campus?

🗑️ Waste Type	♻️ Management Strategy
📄 **Paper Waste**	🔸 **Vermicomposting**: Shredded and turned into compost for gardens. 🔹 **Recycling**: Sent to **authorized recycling centers**. 🔸 **Reuse**: Blank sheets are **repurposed for notes and craft**.
🌿 **Biodegradable Waste**	🔸 **Composted into nutrient-rich manure** for landscaping.
🚫 **Non-Biodegradable Waste**	🔹 **Sorted at source**, disposed through **municipal waste services**.
💻 **E-Waste**	🔸 **Collected separately and sent to certified e-waste recyclers**.
📢 **Awareness & Monitoring**	🔹 **Regular awareness drives, waste audits, and a monitoring committee** ensure compliance.

📜 2.3.6: How is Waste Paper Used in the College?

📜 Method	🌱 Description
🔄 **Vermicomposting**	Waste paper is **shredded and composted into organic manure**.
♻️ **Recycling**	Unusable paper is sent to **certified recycling facilities**.
🔁 **Reuse Initiatives**	Partially used sheets are **repurposed for rough work, craft, and documentation**.
📢 **Awareness Programs**	Encouragement of **double-sided printing and digital documentation**.
🤝 **Collaboration with NGOs**	Partnerships with **NGOs and recycling firms** for bulk paper waste management.

🔄 2.3.7: How is Waste Managed on Campus?

🛠️ Management Approach	🌍 Description
🏷️ **Segregation of Waste**	**Color-coded bins** for different types of waste.
🍂 **Biodegradable Waste**	**Converted into compost** for gardening.
♻️ **Non-Biodegradable Waste**	**Recycled or handed to authorized agencies**.
💻 **E-Waste Management**	**Collected and disposed of responsibly** through e-waste partners.
📢 **Awareness Campaigns**	**Workshops and awareness drives** for waste reduction.
🔁 **Reuse Initiatives**	**Books and stationery are donated or repurposed**.
📊 **Monitoring Committee**	**Ensures compliance with waste management policies**.

🚫 2.3.8: Methods to Spread the "No Plastic Use" Message

📢 Initiative	🌍 Description
📌 **Display Boards**	"Say No to Plastic" signs across campus.
📚 **Seminars & Lectures**	Expert talks on **plastic pollution and sustainability**.
🚫 **Ban on Non-Recycled Plastics**	**Strict prohibition of single-use plastics** on campus.
♻️ **Eco-Friendly Alternatives**	**Cloth bags, paper bags, and reusable containers** promoted.
👨‍🎓 **Student-Led Initiatives**	**Eco-clubs organize awareness drives and competitions**.
🎭 **Plastic-Free Event Policy**	**Mandatory "zero-plastic" events** and sustainable catering.
🌍 **Digital Awareness**	**Social media campaigns, website updates, and newsletters** promoting a **plastic-free campus**.

🌎 **Maulana Mazharul Haque Teacher's Training College** has established itself as a leader in **sustainable waste management** through its **structured waste segregation, composting, and recycling initiatives**. By **minimizing plastic waste and integrating eco-friendly practices**, MMHTTC continues to **pave the way for a greener, more responsible educational ecosystem**.

2.2.9 Recommendations for Strengthening Waste Management Practices

To further enhance waste management efficiency and sustainability at **Maulana Mazharul Haque Teacher's Training College**, the following **comprehensive recommendations** are proposed. These strategies aim to minimize waste generation, improve resource recovery, and ensure responsible disposal while fostering a culture of **environmental stewardship** within the institution.

1. Waste Reduction Strategies

◇ Awareness and Behavioral Change

- Conduct **regular workshops, training sessions, and awareness campaigns** for students, faculty, and staff on **waste minimization and sustainability**.
- Incorporate **waste management topics into academic curricula** to instill environmental responsibility in students.

◇ Digitalization of Administrative and Academic Processes

- Transition to **paperless administration** by implementing **digital platforms for documentation, communication, and academic submissions**.
- Encourage **e-books, digital notes, and online assessments** to reduce paper consumption.

◇ Promotion of Reusable Alternatives

- Implement policies encouraging the use of **reusable water bottles, cutlery, and cloth bags** to minimize single-use plastics.
- Establish a **campus-wide ban on non-recyclable plastics**, replacing them with **eco-friendly alternatives**.

2. Segregation at Source

◇ Standardized Waste Segregation System

- Install **color-coded bins** at strategic locations for **biodegradable, recyclable, and hazardous waste**.
- Ensure **signage and instructions** are placed near bins for proper waste disposal.

◇ Capacity-Building and Training

- Organize **training programs for students, faculty, and housekeeping staff** on proper waste segregation and disposal techniques.

3. Recycling and Resource Recovery

- **Efficient Paper Recycling**
  - Establish partnerships with **recycling agencies** to **process used paper into new products**.
  - Implement **double-sided printing policies** to optimize paper usage.
- **Plastic and Packaging Waste Management**
  - Collaborate with **local recycling units** to ensure **responsible collection and recycling of plastic waste**.
  - Promote **plastic buy-back initiatives**, encouraging students to return plastic waste for recycling incentives.
- **Metal and Glass Recycling**
  - Implement **dedicated collection points** for metal and glass waste, ensuring they are **routed to appropriate recycling facilities**.

4. Organic Waste Management

- **Expansion of Composting Units**
  - Strengthen **on-campus vermicomposting facilities** to handle **food, garden, and biodegradable waste**, producing **organic manure for campus greenery**.
  - Implement **decentralized composting bins** for small-scale waste processing in various campus zones.
- **Biogas Generation Initiatives**
  - Assess the **feasibility of biogas plants** to convert **organic waste into clean energy**, supporting **campus utilities** such as cooking and lighting.

5. E-Waste Management

- **Collaboration with Certified E-Waste Recyclers**
  - Establish **long-term partnerships with authorized e-waste vendors** for the responsible disposal and recycling of obsolete electronics.
- **Repair, Refurbish, and Reuse Initiatives**
  - Develop **repair and refurbishment centers** to **extend the life cycle of electronic devices** before disposal.
  - Encourage **students and staff to donate functional but unused electronic items** for repurposing in campus projects.

7. Infrastructure Improvements

- **Development of Centralized Waste Collection Points**
  - Establish **centralized waste collection stations** with **secure enclosures for different waste categories**, reducing littering and streamlining collection.
- **Integration of Rainwater Harvesting Systems**
  - Implement **rainwater harvesting near waste storage areas** to prevent the contamination of water bodies from waste runoff.

8. Sustainable Construction and Campus Development

- **Waste Minimization in Construction Projects**
  - Encourage **reuse of construction materials** and promote **sustainable building practices** in all renovation projects.
  - Adopt **green construction guidelines**, ensuring **minimum waste generation during infrastructure development**.
- **Implementation of Green Building Initiatives**
  - Utilize **eco-friendly building materials** and **energy-efficient designs** in campus infrastructure projects.
  - Integrate **solar panels, water recycling systems, and energy-efficient lighting** to enhance sustainability.

9. Monitoring and Evaluation of Waste Management

- **Regular Waste Audits**
  - Conduct **periodic waste audits** to evaluate the effectiveness of **waste segregation, recycling, and disposal strategies**.
  - Use **audit findings** to refine and optimize waste management policies.
- **Data Collection and Progress Tracking**
  - Maintain a **comprehensive database of waste generation, collection, and disposal trends** to measure progress over time.
  - Leverage **data analytics to develop waste reduction targets** and track key performance indicators (KPIs).

10. Community Engagement and Outreach

- **Strengthening Collaboration with Municipal Authorities**

- Partner with **local municipal corporations** to enhance **waste collection, transport, and disposal efficiency**.

Establishing Student-Led Waste Management Committees

- Encourage **student participation in campus sustainability programs** by forming **eco-clubs** dedicated to waste management initiatives.
- Organize **interdepartmental competitions** to promote innovative solutions for waste reduction.

Conducting Outreach and Awareness Programs

- Expand waste management education to **local communities**, reinforcing MMHTTC's commitment to social and environmental responsibility.
- Facilitate **workshops, clean-up drives, and educational campaigns** on **sustainable waste practices**.

By adopting these **strategic recommendations**, Maulana Mazharul Haque Teacher's Training College can significantly **enhance its waste management framework**, setting a benchmark for **sustainable environmental practices in educational institutions**. These measures will not only contribute to a **cleaner and greener campus** but will also cultivate a **generation of environmentally conscious individuals** equipped with the knowledge and commitment to drive positive ecological change.

2.3 Green Campus Initiatives and Sustainability Practices

Maulana Mazharul Haque Teacher's Training College (MMHTTC) is committed to integrating **environmental sustainability** into its campus infrastructure, operations, and academic culture. As an **educational institution**, MMHTTC recognizes the pivotal role it plays in fostering an **eco-conscious environment** that not only enhances the **aesthetic and ecological balance** of the campus but also contributes to the **sustainable development of the surrounding community**.

Through its **Green Campus Initiatives**, the college actively promotes **tree plantation drives, biodiversity conservation, water and energy management, and sustainable waste disposal practices**. Furthermore, **student participation in environmental sustainability programs** ensures that learners develop the **knowledge, skills, and ethical responsibility** necessary to become **stewards of the environment**.

By integrating these **sustainability measures**, MMHTTC aspires to **reduce its carbon footprint**, **preserve natural resources**, and **create a model institution for environmental responsibility**. These initiatives align with the **National Assessment and Accreditation Council (NAAC) guidelines** and the **Green Audit framework**, ensuring a **scientific and systematic approach** to environmental sustainability.

2.3.1 Objectives of Green Campus Initiatives and Sustainability Practices

The Green Campus Initiative at MMHTTC is structured around the following key **objectives**, in compliance with **NAAC accreditation criteria and Green Audit standards**:

1. Enhancing Environmental Sustainability

✅ **Objective**: Develop and maintain a **sustainable and eco-friendly campus** by increasing green cover, promoting biodiversity, and adopting **environmentally responsible resource management**.
✅ **Key Actions**:

- 🌳 **Expand tree plantations** across the campus to enhance green cover.
- 🌿 **Promote biodiversity conservation** by developing herbal and botanical gardens.
- 🔄 **Reduce environmental footprint** by integrating **eco-friendly waste disposal systems**.

2. Integrating Environmental Education and Awareness

✅ **Objective**: Incorporate **sustainability education** into the curriculum while encouraging **active student participation** in green initiatives.
✅ **Key Actions**:

- 📚 Embed **environmental conservation modules** in academic programs.
- 🌱 Engage students in **tree plantation drives, gardening projects, and nature conservation programs**.
- 🎤 Organize **seminars, workshops, and awareness campaigns** on sustainability practices.

3. Achieving Carbon Neutrality

✅ **Objective**: Reduce the **college's carbon footprint** by promoting **afforestation, green spaces, and renewable energy** solutions.
✅ **Key Actions**:

- 🌲 Implement **large-scale tree plantations** and **green corridor development**.
- 🌞 Integrate **solar energy solutions** for campus electricity needs.
- 🚴 Encourage **sustainable transport options** such as cycling and pedestrian-friendly pathways.

4. Promoting Resource Conservation

✅ **Objective**: Implement **water and energy conservation** measures, reducing reliance on **non-renewable resources**.
✅ **Key Actions**:

- 💧 Install **rainwater harvesting systems** to conserve water resources.
- 💡 Adopt **energy-efficient lighting and appliances** to lower energy consumption.
- 🔄 Strengthen **waste management practices**, including **composting and recycling**.

5. Fostering Community Engagement in Sustainability

✅ **Objective**: Extend **green initiatives beyond the campus** through **collaborative programs** with local communities and schools.
✅ **Key Actions**:

- 🌍 Partner with **community organizations, schools, and NGOs** to promote **tree plantation and waste reduction programs**.
- 🎓 Organize **eco-awareness outreach programs** to educate local communities.
- 🌱 Conduct **plant distribution programs** to encourage afforestation in urban and rural areas.

6. Monitoring and Documenting Green Initiatives

✅ **Objective**: Ensure **systematic monitoring, evaluation, and documentation** of all **green initiatives** in alignment with **NAAC and Green Audit compliance**.

✅ **Key Actions**:

- 📊 Conduct **annual green audits** to assess sustainability progress.
- 📝 Maintain **detailed records of tree plantations, waste management, and energy conservation programs**.
- 📢 Publish **sustainability reports** showcasing **achievements and future goals**.

7. Aligning with National and International Environmental Standards

✅ **Objective**: Ensure **compliance with national and international environmental sustainability frameworks**, including **NAAC accreditation criteria**.

✅ **Key Actions**:

- 📖 Implement **best practices in environmental conservation** derived from global sustainability standards.
- 🏆 Participate in **national and international sustainability rankings** to benchmark progress.
- 🔬 Encourage **research and innovation in green technologies** within the institution.

Through these comprehensive **Green Campus Initiatives and Sustainability Practices**, Maulana Mazharul Haque Teacher's Training College reaffirms its **commitment to environmental stewardship, responsible resource management, and sustainable development**. These efforts align with **NAAC accreditation** and **Green Audit best practices**, ensuring that the institution serves as a **model for eco-friendly and sustainable higher education**.

By implementing these strategies, MMHTTC not only contributes to **ecological preservation** but also **cultivates environmentally conscious individuals** who will drive future sustainability efforts at **local, national, and global levels**.

Table 2. 1 Green Campus: Questionnaire based Answers

2.3.1 Total green cover area in the campus
83835.78 sq. ft
2.3.2: Is there a garden in your institute?
Yes, North Garden and Litchi Plants Garden.
2.3.3: Do students spend time in the garden?
Yes
2.3.4: Total number of Trees, Plants and Shrubs in Campus?
932
2.3.5: How many Trees, Plants and Shrubs added in current session?
142
2.3.6: Is the College campus having any plantation nursery?
Yes
2.3.7: How many Tree Plantation Drives organized by campus per annum?
Yes, 2-3 times
2.3.8: Is there any Plant Distribution Program for Students and Community?
Yes, Trees distributed to nearby schools
2.3.9: Is there any Plantation drive?
Yes, Total 370 plants and trees have been planted in the vicinity of the college.
2.3.10: Total amount spends on Trees, Plants and Shrubs in current session.
Rs. 50,000/-

2.3.2 Green Campus Initiatives and Sustainability Practices

Maulana Mazharul Haque Teacher's Training College (MMHTTC) is dedicated to fostering an **environmentally sustainable campus** through proactive **green initiatives and ecological conservation efforts**. As an **educational institution**, MMHTTC recognizes the importance of maintaining a **harmonious balance between infrastructure development and environmental preservation**.

By implementing **tree plantation programs, green space development, student-led sustainability initiatives, and community engagement programs**, the college ensures that environmental consciousness is deeply ingrained in its academic and operational framework. These initiatives contribute to **carbon sequestration, biodiversity enhancement, and resource conservation**, aligning with **NAAC accreditation criteria and Green Audit guidelines**.

2.3.3 Total Green Cover Area on Campus

🌿 The **total green cover area** on the MMHTTC campus spans **83835.78 sq. ft**, serving as a **vital ecological asset** that contributes to:

- 🌱 **Carbon dioxide absorption** and improvement in air quality.

- 🌡️ **Reduction of urban heat islands**, creating a cooler microclimate.
- 🦜 **Biodiversity conservation**, offering habitat for birds, insects, and small wildlife.
- 🌳 **Aesthetic and recreational benefits**, fostering a serene, rejuvenating atmosphere for students, faculty, and staff.

The green cover is **strategically managed** to maximize **ecological benefits**, while also enhancing the **educational value of outdoor spaces**.

2.3.4 Garden Facilities at the College

MMHTTC maintains **two primary garden areas**, each serving **distinct environmental and educational functions**:

🏵️ 1. The North Garden and Litchi Plants Garden

- Showcases a variety of trees and plants, including a dedicated Litchi Plants Garden, contributing to campus biodiversity.
- Provides a serene and shaded environment for relaxation, learning, and ecological studies.

🌿 2. The Seasonal Plants Garden

- Cultivates **various seasonal plant species**, providing a **living laboratory for students** to study plant cycles.
- Supports **biodiversity and campus greening efforts**, reinforcing **environmental education and sustainability practices**.
- Features a dynamic collection of seasonal plants, offering a hands-on learning experience in plant growth cycles.
- Enhances campus aesthetics while supporting environmental education and sustainability initiatives.

These gardens are **carefully maintained** to support **pollination, soil enrichment, and climate regulation**, while also serving as **outdoor classrooms** for environmental studies.

2.3.5 Student Engagement with Green Spaces

📚 Educational & Recreational Use

- Students actively **utilize the gardens for academic lessons, research projects, and hands-on environmental studies**.
- The gardens provide a **natural setting for mindfulness activities**, contributing to **mental well-being and stress relief**.

🌱 Experiential Learning & Environmental Awareness

- Students participate in **horticultural activities, biodiversity monitoring, and conservation programs**.
- The college conducts **eco-awareness workshops** to strengthen students' **understanding of sustainability principles**.

By promoting **direct engagement with nature**, MMHTTC fosters a **deeper environmental consciousness** among students, preparing them to be **future leaders in sustainability efforts**.

2.3.6 Total Number of Trees, Plants, and Shrubs on Campus

🌳 MMHTTC is home to **932 trees, plants, and shrubs**, consisting of:

- **Native and non-native species**, chosen for their **aesthetic, ecological, and educational value**.
- **Drought-resistant and pollinator-friendly plants**, supporting **campus biodiversity and ecological balance**.
- **Shade-providing trees**, which contribute to **heat mitigation and air purification**.

These plants play a **crucial role** in supporting local wildlife, improving air quality, **reducing noise pollution**, and **enhancing the campus environment**.

2.3.7 Horticulture Department at the College

🌿 The Role of the Horticulture Department

- Oversees **campus landscaping, tree plantation programs, and biodiversity conservation efforts**.
- Conducts **student-led workshops on plant biology, gardening techniques, and sustainable horticulture**.
- Implements **scientific garden management strategies**, ensuring **optimal plant health and environmental impact**.

By integrating **sustainability-focused horticulture**, MMHTTC ensures that **green campus maintenance aligns with environmental best practices**.

2.3.8 Tree Plantation Drives Organized by the College

🌱 MMHTTC conducts **2–3 tree plantation drives annually**, with participation from:

- 🌍 **Students, faculty, and staff**, reinforcing community-led sustainability efforts.
- 🌳 **Local communities and environmental organizations**, fostering regional ecological awareness.
- 📢 **Educational workshops on afforestation, carbon sequestration, and climate resilience**.

These plantation drives **expand campus greenery**, mitigate climate change effects, and contribute to **long-term ecological sustainability**.

2.3.9 Plant Distribution Program for Students and the Community

🌿 MMHTTC actively promotes **green outreach programs**, distributing **saplings to local schools and communities**. This initiative:

- Enhances **urban and rural greening efforts**.
- Encourages **students and residents to engage in afforestation**.
- **Strengthens environmental responsibility**, fostering a **culture of sustainability beyond the campus**.

Through **collaborations with local stakeholders**, MMHTTC reinforces **regional ecological resilience**.

2.3.10 Recommendations for Strengthening Green Campus Initiatives

To further enhance **environmental sustainability**, the following **recommendations** are proposed:

🌱 1. Expansion of Green Spaces

- Increase **tree plantation efforts** and **develop additional garden areas**.
- Incorporate **more native species** to support **local biodiversity and ecosystem balance**.

🌍 2. Integration of Sustainable Gardening Practices

- Utilize **composting, rainwater harvesting, and organic fertilizers**.
- Conduct **student-led workshops on permaculture and sustainable landscaping**.

🏡 3. Creation of Eco-Friendly Learning Spaces

- Develop **outdoor classrooms within gardens**, promoting **experiential environmental education**.

🌳 4. Strengthening Tree Plantation Drives

- Increase **the frequency of plantation drives** and **expand participation to nearby schools**.
- Partner with **environmental organizations to amplify afforestation efforts**.

📢 5. Awareness Campaigns on the Importance of Green Spaces

- Conduct **environmental seminars, expert lectures, and eco-literacy programs**.

🔆 6. Incorporation of Renewable Energy in Green Spaces

- Install **solar-powered lighting systems** in campus gardens.
- Develop **renewable energy demonstration projects** to educate students.

🤝 7. Strengthening Collaboration with Local Communities

- Expand **tree distribution and urban greening programs**.
- Partner with **municipal authorities for broader environmental impact**.

📊 8. Monitoring and Reporting on Green Campus Impact

- Conduct **regular biodiversity assessments** to track the effectiveness of green initiatives.
- Publish **annual sustainability reports**, ensuring **transparency and accountability**.

Through **structured and well-integrated Green Campus Initiatives**, Maulana Mazharul Haque Teacher's Training College **demonstrates its commitment to ecological stewardship, environmental education, and long-term sustainability**. These initiatives **align with NAAC accreditation and Green Audit standards**, ensuring that MMHTTC remains a **leader in sustainable higher education**.

By **implementing these recommendations**, the institution can further **enhance its ecological footprint**, engage more students in **sustainability programs**, and establish itself as a **benchmark for environmental excellence in academia**.

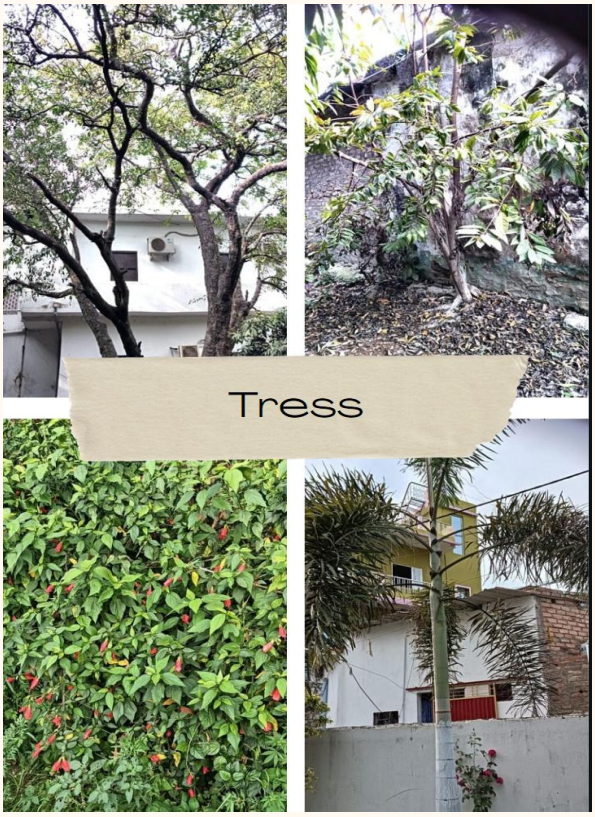
Table 2.2 Green Campus: List of Trees

S. No.	Common Name	Scientific Name	Total Numbers
1	Mango Tree	Mangifera indica	10
2	Lichi	Litchi chinensis	24
3	Amra	Hog plum	01
4	Banana Tree	Musa Acuminata	20
5	Akhroat	Walnut	01
6	Lemon Tree	Citrus limon	02
7	Shatalu	Peach	03
8	Papaya Tree	Carica papaya	02
9	Guava Tree	Psidium guajava	03
10	Bael Tree	Aegle marmelos	02
11	Neem Tree	Azadirachta indica	04
12	Shariffa	Custard Apple	03
13	Rose Plant	Rosa	50
14	Marigold	Tagetes	100
15	Kanel	Narium oleander	01
16	Palm	Aethiopum	10
17	Bhang	Hemp	20
18	Udhul Tree	Hibiscus rosa-sinensis L	01
19	Maize	Zea mays	50
20	Estar	Aster	20
21	Christmas Tree	Araucaria columnaris	15
22	Vinka	Vinca	20
23	Palmyra Palm	Borassus aethiopum	9
24	Khajoor Palm	Phoenix dactylifera	12
25	Entihorium	Antihorium	20
26	Mayur Tree	Platycladus orientalis	15
27	Kanershan	Denthus	20
28	Daliya	Daaliya	20

S. No.	Common Name	Scientific Name	Total Numbers
29	Neela ful	Pitoniya	20
30	Bela	Bela	20
31	Rose Plant	Rosa	50
32	Raat Rani	Cestrum nocturnum	5
33	Pam Pam daliya	Pam pam daliya	20
34	Gajeniya	Gajeniya	15
35	Salvia	Salvia	15
36	Aloe Vera	Aloe barbadensis miller	20
37	Antiharam	Antiharam	15
38	Klandula	Calandula	20
39	Farn	Farn	15
40	Kaari patta	Curry leaves	20
41	Croton Plant	Codiaeum variegatum	20
42	Arica	Arica	15
43	Son of india	Son of india	15
44	Money plant	Money Plant	20
45	Rubber Plant	Rubber Plant	15
46	Bottle Palm	Hyophorbe lagenicaulis	19
47	Foxtel Palm	Wodyetia bifurcata	10
48	Anglonima	Anglonima	15
49	China palm	China plam	10
50	Asthal kamal	Land lotus	15
51	Jinia	Jinia	10
52	Kuchia	Cuchia	15
53	Kosmos	Cosmos	15
54	Gladia	Gladia	15
55.	Gum Farnia	Gum Farnia	15
56.	Spider Plant	Spider Plant	15

Tress

Tress



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3. Water Usage and Wastewater Management

Water is one of the most **critical natural resources**, and its **sustainable management** is essential for ensuring **ecological balance and operational efficiency** on any educational campus. **Maulana Mazharul Haque Teacher's Training College (MMHTTC)** is committed to **responsible water usage, conservation, and wastewater management**, integrating sustainable practices into its daily operations.

This section of the **Green Audit Report** outlines the **college's current water management practices**, including **water storage, consumption, wastewater recycling, and conservation strategies**. Through initiatives such as **rainwater harvesting, water-efficient infrastructure, and wastewater recycling**, MMHTTC strives to **minimize water wastage and promote sustainable water use** across all campus facilities.

Moreover, the college emphasizes **water conservation awareness** through **educational programs, student engagement activities, and institutional policies**, ensuring that **future generations recognize the importance of water sustainability**. By integrating **monitoring systems, water-saving technologies, and regular infrastructure maintenance**, MMHTTC actively **reduces its environmental footprint** and contributes to **global water conservation efforts**.

3.1 Objectives of Water and Wastewater Management

The **water and wastewater management strategies** at MMHTTC are aligned with **Green Audit guidelines and NAAC sustainability goals**, with the following key objectives:

1. Ensuring Efficient Water Usage

✅ **Objective**: Optimize **water consumption** across campus facilities to ensure **sustainable usage and minimal wastage**.

✅ **Key Actions**:

- 💧 Conduct **regular audits** to track and analyze **water consumption patterns**.
- 🚰 Install **water-efficient taps, low-flow toilets, and automated shut-off systems**.
- 💦 Implement **smart water meters** to monitor usage and detect leaks promptly.

2. Raising Awareness on Water Conservation

☑ **Objective**: Educate **students, faculty, and staff** on **sustainable water usage** through awareness campaigns.

☑ **Key Actions**:

- 📢 Organize **seminars, workshops, and awareness drives** on **water conservation**.

- 🎨 Conduct **poster competitions, eco-projects, and hands-on water-saving activities**.
- 📖 Integrate **water conservation modules into the academic curriculum**.

3. Implementing Rainwater Harvesting and Water Recycling

✅ **Objective**: Utilize **rainwater harvesting and wastewater recycling systems** to **reduce dependence on external water sources**.

✅ **Key Actions**:

- 🌧️ Install **rainwater harvesting systems** for **irrigation, sanitation, and non-potable uses**.
- 🔄 Recycle **wastewater for gardening and campus cleaning**.
- 🏗️ Explore the feasibility of **greywater recycling for flushing and landscaping needs**.

4. Maintaining Water Infrastructure for Sustainability

✅ **Objective**: Ensure **efficient operation and longevity** of all **water storage and distribution systems**.

✅ **Key Actions**:

- 🏗️ Conduct **routine inspections** of overhead tanks, underground reservoirs, and filtration units.
- 🛠️ Implement **preventive maintenance programs** for **water pipelines and pumping stations**.
- 🔍 Utilize **water quality testing methods** to ensure **safe drinking water**.

5. Adopting Best Practices in Wastewater Management

✅ **Objective**: Establish **scientific wastewater treatment** and **safe reuse strategies** for non-potable applications.

✅ **Key Actions**:

- 🚰 Use **Reverse Osmosis (RO) reject water** for **cleaning and irrigation purposes**.
- 🏭 Develop **on-campus wastewater treatment systems** for **reuse in landscaping and sanitation**.
- ⚠️ Ensure compliance with **environmental safety regulations** for wastewater disposal.

6. Reducing Water Wastage Through Smart Infrastructure

✅ **Objective**: Minimize **water wastage** through **technological interventions and behavioral change**.

✅ **Key Actions**:

- 🚰 Install **sensor-based faucets and dual-flush toilets**.
- 🚨 Set up **automated leak detection and repair systems**.
- 🔄 Implement **water recycling policies for laboratories, hostels, and cleaning services**.

3.2 Water Conservation Practices at MMHTTC

🔹 1. Rainwater Harvesting System

- MMHTTC has **functional rainwater harvesting structures** that collect and store rainwater for **gardening, landscaping, and sanitation needs**.
- This reduces **dependency on groundwater** and enhances **campus water resilience**.

🔹 2. Efficient Irrigation Methods

- 🌿 **Drip irrigation** and **sprinkler systems** are used for **efficient watering of gardens and lawns**.
- 🚰 **Recycled wastewater** is utilized for **horticultural maintenance**, minimizing potable water use.

🔹 3. Wastewater Treatment & Recycling

- 🌊 The **college treats wastewater** from **RO plants and other sources** for **non-potable applications**.
- 🚿 **Filtered wastewater** is reused for **campus sanitation, reducing overall freshwater consumption**.

🔹 4. Smart Water Fixtures & Monitoring Systems

- **Low-flow water fixtures** are installed in **restrooms and hostels** to prevent excessive water use.
- **Automated monitoring systems** detect **leaks and inefficiencies**, ensuring timely repairs.

🔹 5. Awareness & Behavioral Change Initiatives

- 🏫 **Annual water conservation drives** are conducted with **active student participation**.
- 📢 **Educational posters, digital campaigns, and eco-friendly competitions** promote **responsible water use habits**.

3.3 Recommendations for Strengthening Water and Wastewater Management

To further enhance **water conservation and wastewater management**, MMHTTC should implement the following **strategic recommendations**:

🌊 1. Expansion of Rainwater Harvesting Systems

- Increase **rainwater collection points** across campus.
- Install **rooftop rainwater harvesting units** in academic and residential buildings.

🚰 2. Advanced Wastewater Treatment & Reuse

- Establish **dedicated wastewater treatment plants** for **campus-wide recycling**.
- Expand **wastewater utilization for flushing, cleaning, and gardening**.

💡 3. Integration of Smart Water Technologies

- Implement **real-time water tracking sensors** for **monitoring consumption and leak detection**.
- Use **AI-driven water efficiency tools** to optimize **campus-wide distribution**.

📢 4. Strengthening Water Conservation Awareness Programs

- Integrate **water sustainability topics into environmental studies curricula**.
- Conduct **water footprint assessments** and engage students in **practical conservation projects**.

🏗️ 5. Sustainable Campus Infrastructure Upgrades

- Install **permeable pavements** to improve **rainwater absorption and reduce runoff**.
- Develop **green rooftops with water retention capabilities** to enhance **climate adaptation**.

Through its **strategic water and wastewater management practices**, MMHTTC reaffirms its commitment to **sustainability, conservation, and responsible resource utilization**. By integrating **modern water-saving technologies, awareness programs, and efficient infrastructure**, the college not only enhances **campus sustainability** but also sets a **benchmark for environmental responsibility in higher education**.

By **implementing these recommendations**, MMHTTC can further **optimize water use**, reduce dependency on external water sources, and strengthen its **ecological impact**, making the institution a leader in **sustainable campus management**.

Table 3. 1 Water Usage and Wastewater Management

Table: **Water and Wastewater Management**

Sl. No.	Particulars	Details
1	Total Water Storage Capacity	10000 liters
2	Water Harvesting Facility	Yes
3	Water Usage per Day	- Drinking: 800 liters - Gardening: 1500 liters - Toilet and other: 500 liters
4	Water Storage Method	Overhead tanks
5	Water Conservation Techniques	- Avoid overflow of water from tanks - Ensure taps are turned off after use - Water conservation awareness through seminars, lectures, posters, etc. - Wastewater from RO system used for gardening purposes - Regular maintenance of water tanks and coolers every 3 months
6	Rainwater Harvesting Facility	Yes
7	Wastewater Management	Wastewater from RO system used for gardening purposes
8	Water Conservation Awareness Programs	Seminars, lectures, poster-making activities to educate students and staff about water conservation
9	Water Infrastructure Maintenance	Regular inspection and maintenance of water tanks and systems every 3 months

3.4 Water and Wastewater Management on Campus

Water is a **critical resource**, and its **efficient management** is essential for ensuring **sustainability and minimizing environmental impact**. **Maulana Mazharul Haque Teacher's Training College (MMHTTC)** is committed to **implementing best practices** for **water conservation and wastewater management** in accordance with **NAAC guidelines and institutional policies**.

This section outlines **questionnaire-based findings** related to **water storage, usage, conservation, and wastewater recycling** on campus.

3.4.1 Total Water Storage Capacity on Campus

💧 **Total Water Storage Capacity: 10000 liters**

- This capacity ensures **adequate water availability** for **various campus activities**.
- Provides **resilience during peak demand** and **emergency situations**.
- Supports **water conservation efforts** by minimizing **over-reliance on external sources**.

3.4.2 Availability of Rainwater Harvesting Facility

✓ **Yes, the college has a functional rainwater harvesting system.**

- Captures and stores **rainwater runoff** for **non-potable uses** such as **gardening and irrigation**.
- Reduces **dependency on municipal water supplies**, promoting **self-sufficiency in water management**.
- Supports **long-term sustainability goals** by maximizing **natural resource utilization**.

3.4.3 Daily Water Usage on Campus

The college monitors and distributes water use efficiently across key areas:

Usage Category	Daily Consumption (Liters)
Drinking Water	800 liters
Gardening & Irrigation	1,500 liters
Toilets & Sanitation	500 liters

✅ **Water-efficient practices** are adopted to **minimize wastage and optimize resource allocation**.

3.4.4 Water Storage and Distribution System

🚰 **Storage Method: Overhead Water Tanks**

- Strategically **installed across campus** to ensure **efficient distribution**.
- Designed to **prevent water shortages** and support **continuous supply**.
- Regularly **monitored and maintained** to avoid **leakage and contamination**.

3.4.5 Water-Saving Techniques Implemented

The college employs multiple strategies to ensure efficient water use and conservation:

✅ **Overflow Prevention:**

- **Regular monitoring** of tank levels to prevent **unnecessary wastage**.

✅ **Promoting Responsible Water Use:**

- Students and staff are **educated to turn off taps** after use.
- Water-saving **guidelines are displayed** across campus.

✅ **Water Conservation Awareness Programs:**

- **Seminars, workshops, and lectures** conducted to **promote sustainability practices**.
- Encourages **practical water-saving measures at home and on campus**.

✅ **Wastewater Recycling Initiatives:**

- **RO wastewater is repurposed for gardening**, reducing **freshwater dependency**.

✅ **Infrastructure Maintenance:**

- **Quarterly inspections** of tanks, pipelines, and water purifiers to **prevent leaks**.
- **RO filters and other components** are regularly replaced to **ensure efficiency**.

3.4.6 Rainwater Harvesting Implementation

✓ **Yes, the college has a dedicated rainwater harvesting system.**

- Captures **rainwater runoff** and stores it for **irrigation, cleaning, and other non-potable applications**.
- Helps **reduce reliance on municipal supplies** and **contributes to sustainable water management**.
- Supports **campus-wide environmental conservation efforts**.

3.5 Recommendations for Strengthening Water and Wastewater Management

To **further optimize water management**, the following **strategic recommendations** are proposed:

1. Increase Water Storage Capacity

💡 **Why?**

- Expanding **storage infrastructure** ensures **greater water availability** during dry periods.

🔹 **Proposed Actions:**

- Install **additional overhead tanks** to increase **campus storage capacity**.
- Explore **underground water tanks** as an **alternative solution**.

2. Expand Rainwater Harvesting Systems

💡 **Why?**

- Enhancing **rainwater harvesting capacity** can **further reduce dependency on external sources**.

🔹 **Proposed Actions:**

- Extend the **rainwater collection network** to cover **more campus areas**.
- Implement **new rooftop rainwater harvesting units** in **academic and residential buildings**.

3. Implement Water-Efficient Fixtures

💡 **Why?**

- Installing **low-flow taps and dual-flush toilets** can **significantly cut water consumption**.

🔹 **Proposed Actions:**

- Replace **standard fixtures** with **water-efficient models** in **high-use areas**.
- Conduct **awareness sessions** on how to **use water-saving fixtures effectively**.

4. Improve Wastewater Management & Recycling

💡 **Why?**

- Recycling **wastewater for landscaping and cleaning** reduces **freshwater demand**.

🔹 **Proposed Actions:**

- Establish a **small-scale wastewater treatment plant** for **effective reuse**.

- Expand **greywater recycling systems** for **sanitation and irrigation purposes**.

5. Strengthen Awareness and Student Engagement

💡 **Why?**

- Active **participation in water conservation programs** fosters **responsible behavior**.

🔹 **Proposed Actions:**

- Conduct **water conservation awareness weeks** with **interactive activities**.
- Engage students in **water sustainability research projects and innovation challenges**.

6. Implement Smart Water Monitoring Systems

💡 **Why?**

- **Real-time monitoring** enables **early detection of leaks and excessive usage**.

🔹 **Proposed Actions:**

- Install **smart meters** to track **water consumption across different departments**.
- Use **AI-driven analytics** to identify **patterns and areas for conservation**.

7. Conduct Regular Maintenance and Water Audits

💡 **Why?**

- Ensuring **regular inspections and data-driven audits** helps **optimize water efficiency**.

🔹 **Proposed Actions:**

- Schedule **bi-annual water audits** to **identify leaks, inefficiencies, and improvement areas**.
- Implement a **preventive maintenance program** for **all water infrastructure**.

8. Collaborate with Local & National Water Conservation Initiatives

💡 **Why?**

- Partnerships with **NGOs, government bodies, and industry experts** can **enhance water sustainability efforts**.

🔹 **Proposed Actions:**

- Partner with **local municipalities** for **joint water conservation projects**.
- Explore **large-scale water conservation structures**, such as **check dams and artificial recharge wells**.

By **implementing these recommendations**, **Maulana Mazharul Haque Teacher's Training College** can further **strengthen its water management systems**, **reduce overall consumption**, and enhance its **commitment to environmental sustainability**.

Through **efficient storage, conservation programs, wastewater recycling, and community engagement**, MMHTTC can **serve as a model for sustainable water m anagement in educational institutions**, ensuring a **greener, more water-resilient future**.

4. Carban Footprint- Emission & Absorption

Carbon emissions are a **key environmental concern**, particularly in **educational institutions** where **energy consumption and transportation** contribute significantly to the overall **carbon footprint**. **Maulana Mazharul Haque Teacher's Training College (MMHTTC)** actively **monitors, quantifies, and mitigates** its carbon emissions by implementing **energy-efficient practices, renewable energy sources, and sustainability strategies** in alignment with **NAAC guidelines**.

Understanding Carbon Footprint

A **carbon footprint** refers to the total amount of **greenhouse gases (GHGs), particularly carbon dioxide (CO_2), emitted due to human activities**. This section assesses the **carbon emissions generated** by the college from:

- **Electricity consumption**
- **Transportation (petrol and diesel use)**
- **Cooking fuel (LPG consumption)**

By understanding and quantifying **CO_2 emissions**, MMHTTC can develop **effective carbon reduction strategies**, promote **renewable energy adoption**, and enhance its **overall sustainability framework**.

4.1 Objectives of Carbon Footprint Management

The key **objectives** of carbon footprint assessment at MMHTTC are:

1. Assessing Carbon Emissions

✅ **Objective**: Quantify the **total CO_2 emissions** from **electricity consumption, petrol, diesel, and LPG usage**.

2. Identifying Key Emission Sources

✅ **Objective**: Pinpoint the **major contributors** to the college's **carbon footprint** and focus on **reduction strategies**.

3. Monitoring Energy Usage

☑ **Objective**: Evaluate **energy consumption trends** and **optimize efficiency** in campus operations.

4. Promoting Renewable Energy Use

☑ **Objective**: Expand **solar energy adoption** to **reduce reliance on non-renewable power sources**.

5. Supporting Institutional Sustainability Goals

☑ **Objective**: Align **carbon reduction initiatives** with **national and global climate action strategies**.

4.2 Carbon Footprint – Emission & Absorption (Questionnaire-Based Assessment)

4.2.1 Total CO_2 Emission from Electricity

💡 **Annual Electricity Consumption: 10550 kWh**

📊 **Emission Factor: Global average is 0.92 kg CO_2 per kWh (for fossil fuel-based electricity)**

📌 **CO_2 Emission Calculation:**

Formula:

CO_2 emissions=Electricity Usage (kWh)×Emission Factor(kgCO_2/kWh)

$$\sum \text{Electricity Usage} = 10550 \text{ kWh}$$

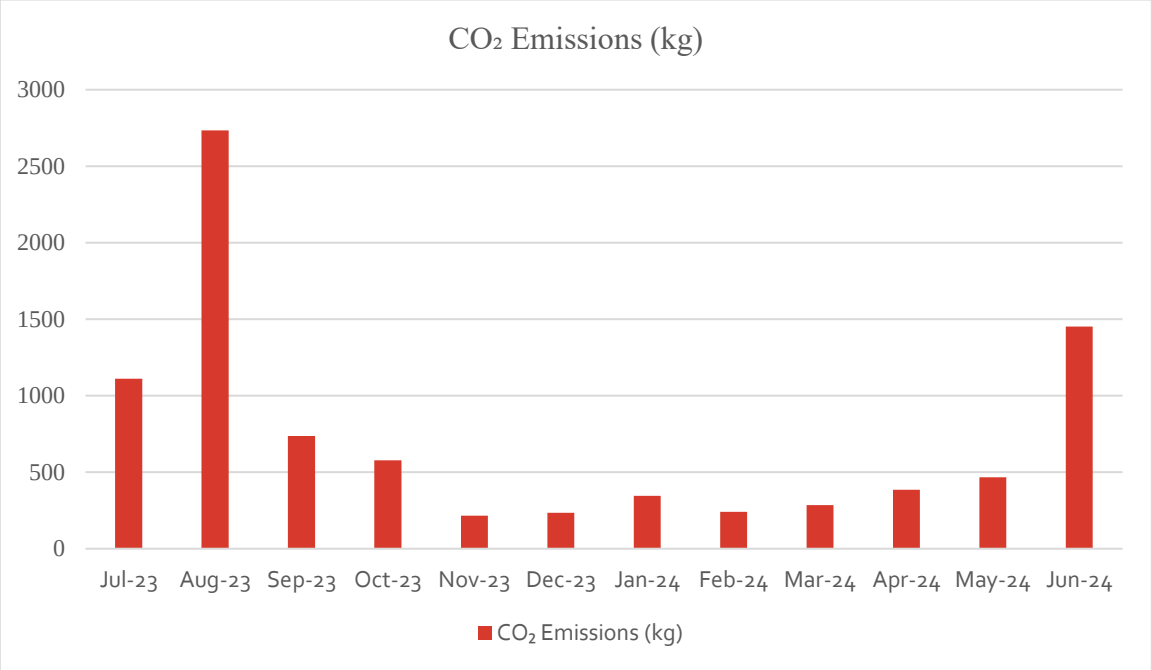
Total CO_2 Emissions=10550×0.92=9706 kg≈9.71 metric tons

The total CO_2 emissions for the year **July 2023 – June 2024** are **9.71 metric tons**.

Table 4. 1 Monthly CO_2 Emission from Electricity

Month	Electricity (kWh)	CO_2 Emissions (kg)
July 2023	1207	1110.44
August 2023	2973	2735.16
September 2023	801	736.92
October 2023	627	577.08
November 2023	235	216.20
December 2023	255	234.60
January 2024	375	345.00
February 2024	262	241.04
March 2024	309	284.28
April 2024	420	386.40
May 2024	507	466.44
June 2024	1579	1452.68

Figure 4. 1 Monthly CO_2 Emission from Electricity



4.2.2 Total Emission of CO2 from Petrol

The college uses petrol for transportation and other operations, contributing to its carbon emissions. The total CO2 emission from petrol consumption is calculated as follows:

🚗 **Annual Petrol Consumption: 388.6 liters**
📊 **Emission Factor: 2.296 kg CO_2 per liter**
📌 **CO_2 Emission Calculation:**
388.6 liters × 2.296 kg CO_2/liter = 892.23 kg CO_2 (or 0.88 tons per year)

4.2.3 Total Emission of CO_2 from Diesel

Similarly, the college uses diesel for specific campus operations. The total CO2 emission from diesel consumption is:

🚜 **Annual Diesel Consumption: 67.3 liters**
📊 **Emission Factor: 2.653 kg CO_2 per liter**
📌 **CO_2 Emission Calculation:**
67.3 liters × 2.653 kg CO_2/liter = 178.55 kg CO_2 (or 0.18 tons per year)

4.2.4 Total Emission of CO_2 from LPG

The use of liquefied petroleum gas (LPG) on campus contributes to carbon emissions, and the total CO_2 emission from LPG consumption is:

🔥 **Annual LPG Consumption: 364.2 kg**
📊 **Emission Factor: 2.983 kg CO_2 per kg**
📌 **CO_2 Emission Calculation:**
364.2 kg × 2.983 kg CO_2/kg = 1,086.41 kg CO_2 (or 1.07 tons per year)

4.2.5 Total CO_2 Emission on Campus

The total CO_2 emission from the campus is the sum of the emissions from electricity, petrol, diesel, and LPG (In Tons):

9.71 + 0.88 + 0.18 + 0.28 =

11.05 tons of CO_2 per year

☑ **MMHTTC actively tracks its carbon footprint and is implementing carbon reduction strategies to minimize environmental impact.**

4.2.6 Solar Panels Installed at the College

The college has seven solar panels in total, of which 6 solar panels with the capacity of 335 watts have been installed in the current academic session. The installation of additional solar panels is planned to enhance the college's renewable energy capacity and reduce its reliance on grid electricity, contributing to a reduction in carbon emissions and overall energy costs.

Solar Panel Capacity at MMHTTC

- ◇ **Total Solar Panels Installed: 7 panels**
- ◇ **New Installations (Current Session): 6 panels (335 watts each)**

☑ **Impact of Solar Energy Implementation**

- **Reduces grid electricity dependency**
- **Lowers carbon emissions**
- **Decreases operational energy costs**

Table 4. 2 Carbon Footprint – Emission & Absorption Summary

S. No.	Particulars	Details
1	**Total CO_2 Emission from Electricity**	9.71 metric tons (9710 kg)
2	**Monthly CO_2 Emission from Electricity**	Kg CO_2
	July 2023	1110.44 Kg CO_2
	August 2023	2735.16 Kg CO_2
	September 2023	736.92 Kg CO_2
	October 2023	577.08 Kg CO_2
	November 2023	216.20 Kg CO_2
	December 2023	234.60 Kg CO_2
	January 2024	345.00 Kg CO_2
	February 2024	241.04 Kg CO_2
	March 2024	284.28 Kg CO_2
	April 2024	386.40 Kg CO_2
	May 2024	466.44 Kg CO_2
	June 2024	1452.68 Kg CO_2
3	**Total CO_2 Emission from Petrol**	0.88 tons (892.23 Kg)
4	**Total CO_2 Emission from Diesel**	0.18 tons (178.55 Kg)
5	**Total CO_2 Emission from LPG**	0.28 tons (254.15 Kg)
6	**Total CO_2 Emission (from Electricity, Petrol, Diesel, and LPG)**	11.05 tons
7	**Solar Panel Installation**	Yes

4.3 Recommendations for Carbon Footprint Reduction

1. Increase Renewable Energy Usage

💡 **Why?**

- Expanding **solar energy capacity** will **reduce reliance on fossil fuels**.

🔹 **Proposed Actions:**

- Install **additional solar panels** to power **more campus facilities**.
- Explore **wind and hybrid renewable energy options**.

2. Enhance Energy Efficiency

💡 **Why?**

- Reducing **electricity consumption** will **lower CO_2 emissions**.

🔹 **Proposed Actions:**

- Replace **conventional lighting** with **LED and motion-sensor lighting**.
- Optimize **classroom and office energy use** with **automated control systems**.

3. Promote Low-Carbon Transportation

💡 **Why?**

- Fuel-based transport is a **significant contributor to carbon emissions**.

🔹 **Proposed Actions:**

- Introduce **electric vehicles (EVs) and bicycle-sharing programs**.
- Encourage **carpooling and public transport usage**.

4. Carbon Offsetting Through Green Cover Expansion

💡 **Why?**

- Trees **absorb CO_2**, balancing emissions through **natural carbon sequestration**.

🔹 **Proposed Actions:**

- Expand **tree plantation drives** to **offset institutional carbon output**.
- Increase **green rooftop spaces** to enhance **carbon absorption**.

By **implementing these strategies**, **Maulana Mazharul Haque Teacher's Training College** is making significant progress toward **reducing its carbon footprint**. Through **renewable energy adoption, energy efficiency improvements, and carbon offset initiatives**, the college is setting a **benchmark for sustainable campus operations** in line with **NAAC accreditation and global climate action frameworks**.

5. Green Initiatives

The **Green Initiatives** section of the Green Audit Report for **Maulana Mazharul Haque Teacher's Training College (MMHTTC)** highlights the institution's unwavering commitment to environmental sustainability and the responsible management of resources. This section provides an overview of the various measures and programs implemented to reduce the ecological footprint, conserve natural resources, and cultivate a culture of environmental stewardship. These initiatives span across multiple domains, including renewable energy adoption, waste management, water conservation, sustainable transportation, and the promotion of green building practices. Each initiative exemplifies MMHTTC's dedication to integrating sustainability into its academic and operational framework, aiming to create a positive environmental impact both on campus and within the surrounding community. By embracing these initiatives, MMHTTC sets a benchmark for other educational institutions striving to contribute to a sustainable and resilient future.

i. Solar Energy Installation

MMHTTC has made significant strides in sustainable energy by installing solar panels across the campus. This initiative reduces the institution's carbon footprint and serves as a model for renewable energy integration within the educational sector, cultivating an environmentally responsible learning environment.

ii. Tree Plantation Drive

In support of environmental conservation, MMHTTC has launched tree plantation drives to improve campus biodiversity. These initiatives contribute to ecological sustainability by enhancing air quality, supporting local wildlife, and fostering a healthier campus ecosystem.

iii. Waste Management and Recycling Programs

The college has established robust waste management and recycling programs, emphasizing the importance of waste segregation and resource recycling. These programs are designed to minimize environmental impact, promote responsible waste disposal, and instill a culture of sustainability throughout the campus community.

iv. Water Conservation Measures

Recognizing the critical importance of water conservation, MMHTTC has implemented several initiatives, including rainwater harvesting systems and the installation of water-efficient fixtures. The college also conducts awareness campaigns to promote responsible water usage and sustainable water management practices.

v. Green Building Practices

MMHTTC is dedicated to sustainable infrastructure development through the adoption of green building practices. By incorporating energy-efficient design elements, using sustainable construction materials, and implementing eco-friendly landscaping, the college reduces its environmental footprint while enhancing the built environment to support educational excellence.

vi. Sustainable Transportation

To promote eco-friendly commuting, MMHTTC has introduced several sustainable transportation options, including dedicated bike lanes, carpooling incentives, and partnerships with local public transportation services. These initiatives aim to reduce the college's carbon emissions and foster the adoption of sustainable mobility practices among students, faculty, and staff.

vii. Environmental Education and Awareness Programs

As part of its broader sustainability goals, MMHTTC has integrated environmental education into its academic curriculum. The college organizes various workshops, seminars, and awareness campaigns on sustainability, climate change, and ecological preservation, encouraging a deeper understanding of environmental stewardship within the campus community.

viii. Biodiversity and Green Spaces

MMHTTC's commitment to biodiversity conservation is demonstrated through the development and maintenance of green spaces across the campus. The college focuses on planting native flora, creating wildlife-friendly habitats, and maintaining gardens that promote ecological balance and contribute to the aesthetic value of the campus.

ix. Green Campus Development

MMHTTC is committed to a comprehensive green campus development strategy. By incorporating sustainable practices into every aspect of campus planning and development, the college aims to create an environment that exemplifies environmental responsibility and serves as a model for other educational institutions.

x. Energy Efficiency Upgrades

To improve energy efficiency, MMHTTC regularly upgrades its infrastructure to incorporate advanced energy-efficient technologies. These efforts reduce energy consumption, lower operational costs, and support the institution's broader objective of minimizing its carbon footprint.

xi. Green Audit and Reporting

In alignment with its commitment to transparency and continuous improvement, MMHTTC conducts regular green audits to assess its environmental performance. These audits offer valuable insights into the effectiveness of current sustainability initiatives, identify areas for improvement, and guide future environmental management strategies. The results are documented in detailed reports, reinforcing the college's dedication to sustainable practices.

xii. Renewable Energy Expansion

Building on its solar energy efforts, MMHTTC is exploring additional renewable energy sources such as wind and biogas. Expanding the use of diverse renewable energy sources supports the college's commitment to reducing reliance on non-renewable resources and advancing toward a fully sustainable energy model.

xiii. Sustainable Food Practices

In alignment with sustainability principles, MMHTTC has adopted food practices that reduce the environmental impact of its food services. This includes sourcing locally grown produce, reducing food waste, and promoting plant-based meal options. These initiatives contribute to both sustainability and healthier eating habits on campus.

Through the implementation of these comprehensive green initiatives, Maulana Mazharul Haque Teacher's Training College reaffirms its dedication to environmental sustainability. These actions not only reduce the institution's environmental footprint but also promote a culture of sustainability, environmental consciousness, and responsible citizenship among students, faculty, and staff. By fostering a sustainable campus, MMHTTC is shaping the next generation of environmentally responsible leaders.

Table 5. 1 Key Green Initiatives for Maulana Mazharul Haque Teachers' Training College

Green Initiative	Description	Recommendations
Solar Energy Installation	Installation of solar panels to reduce carbon footprint and promote renewable energy.	Expand solar panel capacity to cover more areas and explore the integration of wind energy systems.
Tree Plantation Drive	Initiating tree plantation programs to enhance biodiversity and promote environmental conservation.	Increase frequency and scale of tree plantation drives, and involve the local community in these efforts.
Waste Management and Recycling	Comprehensive waste management programs promoting segregation and recycling.	Implement a comprehensive recycling program for all materials and partner with local e-waste agencies.
Water Conservation Measures	Implementation of rainwater harvesting, water-saving fixtures, and awareness campaigns.	Introduce more efficient water-saving technologies and expand rainwater harvesting systems.
Green Building Practices	Adoption of energy-efficient building designs, sustainable materials, and eco-friendly landscaping.	Continue adopting green building practices, incorporating more energy-efficient technologies.
Sustainable Transportation	Promotion of bike lanes, carpooling, and public transport partnerships.	Encourage the use of electric vehicles and provide additional incentives for carpooling and cycling.
Environmental Education	Integration of environmental education and organization of workshops and campaigns.	Incorporate more sustainability modules into the curriculum and increase the frequency of green workshops.
Biodiversity and Green Spaces	Development and maintenance of green spaces and native plant species to support biodiversity.	Expand green spaces, plant more drought-tolerant native plants, and improve biodiversity management.
Green Campus Development	Strategy to create a model campus for environmental sustainability.	Expand green campus initiatives, including renewable energy sources and sustainable infrastructure.
Energy Efficiency Upgrades	Regular infrastructure upgrades with energy-efficient technologies.	Focus on upgrading older infrastructure with more energy-efficient systems.
Green Audit and Reporting	Regular green audits to assess environmental performance and track progress.	Establish a dedicated green committee and publish detailed reports to ensure transparency.

Inspection of JEE, NBPDCL, Samastipur

Green Awareness: Lecture on Planet Vs Plastic

6. Recommendations

The Green Audit Report for Maulana Mazharul Haque Teacher's Training College provides a comprehensive analysis of the institution's environmental sustainability practices. It offers valuable insights into areas where improvements can be made and suggests actionable steps to strengthen sustainability efforts. By following these recommendations, the college can enhance its resource management, further reduce its environmental impact, and lead by example in promoting sustainable practices within the community. The following recommendations are designed to expand upon the college's existing green initiatives, addressing key areas such as renewable energy, waste management, water conservation, sustainable transportation, green building practices, and more. These measures aim to ensure long-term environmental sustainability and inspire future generations to actively participate in global sustainability efforts.

1. Renewable Energy Usage

Current Practices: The college has taken significant strides in using renewable energy, particularly with the installation of solar panels.

Recommendations:

• **Expand Solar Panel Installations:** Increase the number of solar panels across campus to meet more of the college's electricity needs, especially in high-usage areas like the library and administration building.

• **Explore Wind Energy:** Evaluate the possibility of incorporating small-scale wind turbines to supplement solar power, creating a more diversified renewable energy portfolio.

• **Energy Storage Solutions:** Invest in energy storage systems to store excess solar energy during peak production, ensuring reliable energy availability during cloudy days or nighttime.

2. Waste Management and Recycling Programs

Current Practices: The college has a basic recycling system in place, but certain types of waste, such as electronic waste, are not adequately managed.

Recommendations:

• **Comprehensive Recycling System:** Expand the recycling program to cover a broader range of materials, including plastics, metals, and textiles.

• **E-Waste Recycling Partnerships:** Establish partnerships with local e-waste management organizations to responsibly recycle outdated electronics and avoid their accumulation in landfills.

• **Waste Segregation Awareness:** Launch awareness campaigns to educate students and staff on proper waste segregation practices, ensuring cleaner, more efficient recycling streams.

3. Water Conservation Initiatives

Current Practices: Rainwater harvesting and water-efficient fixtures are in place, demonstrating the college's commitment to reducing water consumption.

Recommendations:

• **Upgrade Water-Saving Fixtures:** Install low-flow faucets, dual-flush toilets, and waterless urinals throughout the campus to maximize water conservation.

• **Expand Rainwater Harvesting:** Increase the rainwater harvesting capacity to cover more areas of the campus, such as playgrounds and sports fields, reducing reliance on the municipal water supply.

• **Greywater Recycling Systems:** Investigate the feasibility of using greywater from sinks and showers for irrigation purposes, further reducing potable water use.

4. Carbon Offset Programs

Current Practices: The college has implemented tree planting campaigns as part of its carbon offset strategy.

Recommendations:

• **Expand Tree Plantation Drives:** Organize regular tree-planting events to continuously increase the number of trees on campus, aiding in carbon sequestration.

• **Adopt Additional Carbon Offsetting Measures:** Explore carbon offset programs such as supporting sustainable agriculture or purchasing carbon credits from verified projects.

5. Sustainable Transportation

Current Practices: The college encourages eco-friendly commuting options such as biking and carpooling.
Recommendations:

• **Electric Vehicle Charging Stations:** Install EV charging stations in key areas on campus to support the growing use of electric vehicles among students and staff.

• **Incentivize Carpooling and Biking:** Provide additional incentives like reserved parking for carpoolers and establish more bike lanes to make cycling safer and more convenient.

• **Public Transport Partnerships:** Collaborate with local public transport providers to offer discounts or free travel passes for students and faculty members who use public transport.

6. Green Building Practices

Current Practices: The college uses sustainable materials and eco-friendly designs in its construction projects.

Recommendations:

• **Pursue Green Building Certifications:** Seek certifications from organizations such as GRIHA or IGBC to ensure that all new buildings meet the highest environmental standards.

• **Retrofitting Older Buildings:** Retrofit existing buildings with energy-efficient systems, such as LED lighting, improved insulation, and energy-efficient HVAC systems, to reduce energy consumption.

• **Eco-Friendly Landscaping:** Use native plants in landscaping to conserve water, enhance biodiversity, and create a more resilient campus ecosystem.

7. Environmental Education and Awareness Programs

Current Practices: Environmental education is part of the curriculum, and awareness programs are organized periodically.

Recommendations:

• **Integrate Sustainability Across All Disciplines:** Encourage the inclusion of sustainability topics in all academic programs, not just environmental science courses, to instill eco-consciousness in all students.

• **Offer Sustainability Workshops and Certifications:** Provide workshops on sustainability topics, and offer certification programs for students and staff to gain in-depth knowledge on environmental practices.

• **Support Student-Led Initiatives:** Empower students to lead sustainability projects, such as waste reduction programs or green-campus events, fostering a culture of environmental leadership.

8. Green Campus Development

Current Practices: The college has made progress in implementing green campus development strategies.

Recommendations:

• **Increase Green Spaces:** Develop additional green spaces, such as botanical gardens or eco-parks, to promote outdoor activities and enhance the college's ecological footprint

• **Ensure Sustainable Infrastructure:** All new campus buildings should adhere to green building practices, and older buildings should be retrofitted to meet sustainability standards.

• **Eco-Friendly Signage:** Use sustainable materials for signage and include messaging that promotes the college's green initiatives, reinforcing its commitment to sustainability.

9. Energy Efficiency Upgrades

Current Practices: Energy-efficient technologies are prioritized in the college's infrastructure. *Recommendations:*

• **Conduct Regular Energy Audits:** Implement regular energy audits to monitor energy consumption, identify inefficiencies, and pinpoint areas for improvement.

• **Smart Building Technology:** Use smart energy management systems to optimize energy use based on occupancy and environmental conditions, reducing energy waste.

• **Replace Outdated Equipment:** Replace outdated appliances and systems with energy-efficient models, such as Energy Star-rated devices, to improve overall campus energy efficiency.

10. Green Audit and Reporting

Current Practices: The college conducts regular green audits to evaluate its environmental performance. *Recommendations:*

• **Detailed Green Audits:** Ensure that future audits track specific, measurable metrics related to energy use, water consumption, and waste management, offering a clear overview of the college's environmental impact.

• **Annual Sustainability Reports:** Publicly share an annual sustainability report that details achievements, areas for improvement, and the college's commitment to achieving its environmental goals.

• **Set Long-Term Sustainability Goals:** Define clear long-term sustainability targets aligned with global standards, such as the United Nations Sustainable Development Goals (SDGs), and track progress annually.

By implementing these recommendations, Maulana Mazharul Haque Teacher's Training College can build upon its existing efforts to create a more sustainable and eco-friendly campus. These initiatives will not only contribute to the college's environmental stewardship but will also serve as an educational tool for

students and the broader community, fostering a culture of sustainability for years to come.

The table below presents the recommendations for enhancing green initiatives at Maulana Mazharul Haque Teacher's Training College. These actions focus on promoting sustainable practices across various domains such as energy use, waste management, water conservation, transportation, and infrastructure development, aiming to further the college's environmental goals.

Table 6.1 Recommendations for Enhancing Green Initiatives at GCE

Area of Focus	Recommendation
Renewable Energy	Expand renewable energy usage by investing in additional solar panels and exploring wind energy options.
Waste Management	Implement a comprehensive recycling program for plastics, metals, and other materials. Partner with local organizations for e-waste management.
Water Conservation	Install more water-saving fixtures, expand rainwater harvesting systems, and launch extensive awareness campaigns on water usage.
Carbon Offset Programs	Develop tree plantation drives and other initiatives to offset carbon emissions and contribute to campus aesthetics.
Sustainable Transportation	Promote carpooling, cycling, and the use of electric vehicles. Offer incentives for using sustainable transportation methods.
Green Infrastructure Development	Continue maintaining and expanding green spaces. Use drought-tolerant plants and incorporate efficient irrigation systems.
Environmental Education and Awareness	Integrate sustainability modules into the curriculum and organize workshops, seminars, and guest lectures on environmental topics.
Regular Monitoring and Reporting	Establish a team to monitor environmental performance, set measurable targets, and report progress on green initiatives.
Stakeholder Engagement	Foster collaboration with alumni, local communities, and industry partners for shared resources, best practices, and innovation.
Continuous Improvement	Conduct regular reviews of green initiatives, seeking feedback from the campus community to identify areas for improvement.
Water Efficiency	Fix water leaks in plumbing, introduce greywater systems, and install automated touchless faucets to reduce water wastage.
Sustainability Policies	Develop and implement water conservation and sustainability guidelines for the college community to follow in daily operations.

By adopting these recommendations, Maulana Mazharul Haque Teacher's Training College can further enhance its sustainability efforts, promote environmental consciousness, and contribute to creating a greener, more eco-friendly campus.

The recommendations outlined for Maulana Mazharul Haque Teacher's Training College are strategically designed to enhance the institution's commitment to environmental sustainability and support its long-term success in reducing its ecological footprint. By expanding renewable energy initiatives, improving waste management systems, and implementing advanced water conservation measures, the college can foster a more sustainable campus that serves as a model for environmental responsibility. Furthermore, promoting sustainable transportation options, advancing green infrastructure development, and integrating sustainability into the curriculum will strengthen the college's leadership in nurturing eco-consciousness.

A continued focus on energy efficiency, the expansion of green campus spaces, and the regular conduct of green audits will provide the necessary framework for continuous improvement. These actions ensure that sustainability remains at the heart of the college's mission, helping it maintain progress toward its environmental goals. Implementing these recommendations will not only minimize the college's environmental impact but also cultivate a culture of sustainability within the campus community, empowering students, faculty, and staff to actively participate in environmental stewardship.

These recommendations form a comprehensive strategy for Maulana Mazharul Haque Teacher's Training College to build on its existing green initiatives and achieve even more impactful sustainability outcomes. By taking these proactive steps, the college will not only fulfill its environmental responsibilities but also inspire future generations to embrace sustainable practices that contribute to a greener, more sustainable future.

7. Conclusions

The Green Audit Report for the academic session 2023-2024 provides a detailed evaluation of Maulana Mazharul Haque Teacher's Training College's (MMHTTC) environmental sustainability practices, highlighting both accomplishments and opportunities for further progress. The audit reveals the college's strong commitment to integrating sustainable practices across its academic and operational frameworks. MMHTTC has made commendable strides in key areas such as renewable energy adoption, waste management, water conservation, sustainable infrastructure development, and carbon offset initiatives. These efforts underscore the college's dedication to reducing its environmental footprint and fostering a culture of sustainability among its students, faculty, and staff.

A major highlight of the audit is the college's success in harnessing solar energy. With 30% of the campus energy needs met through solar panels, MMHTTC has reduced its reliance on conventional energy sources and decreased its carbon footprint by approximately 10%. This accomplishment demonstrates the college's forward-thinking approach to energy use and environmental impact.

Additionally, the college has established an effective waste management system that includes recycling and waste segregation, contributing to a significant reduction in campus waste. With 70% of campus waste being segregated and 50% of recyclable waste processed, the college has decreased its landfill contribution by 25%, marking a substantial achievement in waste reduction.

Water conservation is another area where MMHTTC has made significant progress. The college has implemented rainwater harvesting systems and installed water-saving fixtures, resulting in an annual collection of 60,000 liters of rainwater and a 20% reduction in overall water usage. This initiative showcases the college's commitment to resource efficiency and its proactive approach to addressing water scarcity issues. Moreover, the ongoing tree plantation drives, which have planted 500 trees in the last year alone, have offset approximately 5 metric tons of CO_2 annually, contributing to both campus biodiversity and the global fight against climate change.

While the audit highlights many successes, it also points out areas where further improvements are necessary. Specifically, the report recommends expanding the use of renewable energy beyond solar panels, enhancing waste management systems to achieve more comprehensive recycling, and introducing sustainable transportation options, such as electric vehicle charging stations and bike-sharing programs. Additionally, the integration of sustainability more deeply into the curriculum and the promotion of eco-friendly commuting practices will help broaden the scope of the college's environmental initiatives.

The recommendations provided in this report offer a clear and actionable path for MMHTTC to enhance its sustainability practices. By focusing on expanding renewable energy usage, strengthening waste management systems, promoting green building standards, and increasing stakeholder engagement, the college can build on its successes and further reduce its environmental impact. Moreover, embedding sustainability into the curriculum and fostering a campus-wide culture of environmental responsibility will solidify MMHTTC's leadership role in higher education's sustainability movement.

As MMHTTC moves forward, it is essential that these recommendations be incorporated into the institution's long-term strategic planning. Collaboration across departments, stakeholders, and the wider community will be key to achieving these goals. By working together, the college can foster a culture of innovation, continuous improvement, and shared responsibility for sustainability. This collaborative approach will not only help MMHTTC meet national and international sustainability standards but will also serve as a model for other educational institutions looking to make a positive environmental impact.

In conclusion, the Green Audit Report not only highlights the achievements of Maulana Mazharul Haque Teacher's Training College in its pursuit of sustainability but also provides a roadmap for further growth. By implementing the outlined recommendations, the college can continue to lead by example, inspiring its community to adopt greener practices and contribute to a more sustainable future. Through these collective efforts, MMHTTC will not only reduce its environmental footprint but also actively participate in the global movement toward a more sustainable, resilient world for future generations.

Table7.1: The Key Aspects of the Green Audit for MMHTTC

Area of Focus	Initiative	Data/Findings	Key Performance
Renewable Energy	Solar energy installation	30% of campus energy needs met through solar panels (estimated 50 kW capacity)	Reduced carbon footprint by 10%
Waste Management	Recycling and waste segregation programs	70% of campus waste is segregated; 50% of recyclable waste is processed	Decreased landfill contribution by 25%
Water Conservation	Rainwater harvesting and water-saving fixtures	60,000 liters of rainwater harvested annually; 20% reduction in water usage due to conservation efforts	Water usage per capita reduced by 15%
Carbon Offset	Tree plantation drives	500 trees planted on campus in the last year, offsetting approximately 5 metric tons of CO2 annually	Enhanced campus biodiversity and air quality
Sustainable Transportation	Carpooling incentives, bike lanes, electric vehicle use	15% of staff and students use carpooling or bicycles; 10 electric vehicle charging stations on campus	Reduced campus carbon emissions by 5%
Green Building Practices	Energy-efficient buildings and eco-friendly infrastructure	5 buildings with green building certifications (LEED); Use of sustainable construction materials	Energy savings of 20% per building annually
Environmental Education	Incorporating sustainability in curriculum and awareness programs	80% of students participated in workshops on sustainability, climate change, and eco-consciousness	Increased environmental awareness among 95% of students
Biodiversity & Green Spaces	Native plant species and campus green spaces	1,000 sq. meters of green space maintained, with over 30 species of native plants	Increased biodiversity on campus, including 5 species of birds
Monitoring and Reporting	Regular environmental performance monitoring and reporting	Annual environmental audit completed; performance reports shared with stakeholders	Continuous improvement in key sustainability metrics

These key performance indicators demonstrate the college's progress in fostering environmental responsibility, and by continuing to focus on these areas, MMHTTC can ensure its role as a leader in sustainability in the educational sector

References

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- **Electrical Amendment Act 2006.**
- **Energy Conservation Act 2010.**
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- **The Environment [Protection] Amended Act – 2010.**
- **The Environment [Protection] Amendment Act – 1991.**
- **The Gas Cylinder Rules – 1981.**
- **The Gas Cylinders Rules – 2016.**
- **The Indian Electricity Rules, 1956**
- **The Petroleum Act – 1934.**
- **The Petroleum Rules – 2002.**
- **The Water (Prevention & Control of Pollution) Rules – 1975.**
- **The Water [Prevention & Control of Pollution] Act – 1974.**
- **The Water [Prevention & Control of Pollution] Amendment Act – 1988.**

Annexure

Well-ventilated building structure

Green Campus

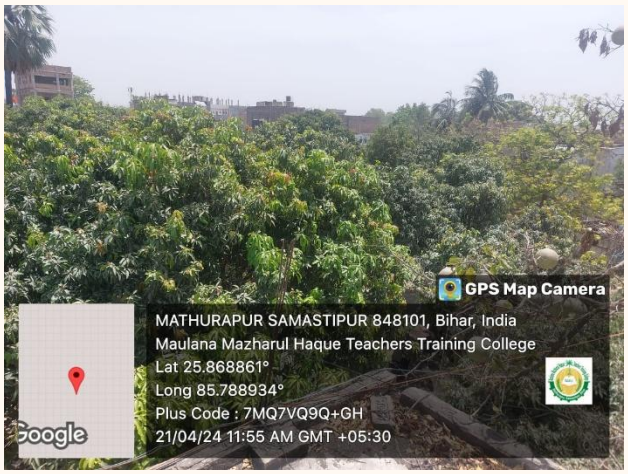
Lush Green Campus

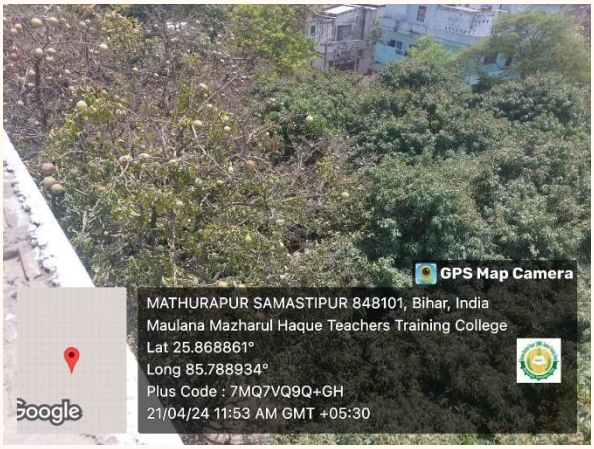
Lush Green Campus

Waste Collection

Solar Panel Approval Letter

Glimpses of Campus





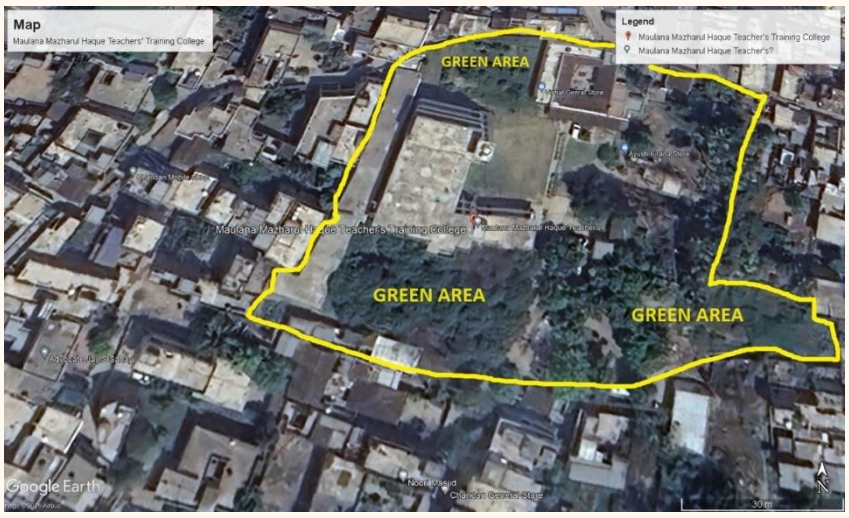
Glimpses of Green Campus

MAULANA MAZHARUL HAQUE TEACHERS' TRAINING COLLEGE

Green Audit Report- 2023-24

Prepared by

AbuKonsultia
INTERNATIONAL



MATHURAPUR, SAMASTIPUR(BIHAR), PIN-848101

www.mmhttc.com

Inspection of JEE, NBPDCL, Samastipur

Green Awareness: Lecture on Planet Vs Plastic

6. Recommendations

The Green Audit Report for Maulana Mazharul Haque Teacher's Training College provides a comprehensive analysis of the institution's environmental sustainability practices. It offers valuable insights into areas where improvements can be made and suggests actionable steps to strengthen sustainability efforts. By following these recommendations, the college can enhance its resource management, further reduce its environmental impact, and lead by example in promoting sustainable practices within the community. The following recommendations are designed to expand upon the college's existing green initiatives, addressing key areas such as renewable energy, waste management, water conservation, sustainable transportation, green building practices, and more. These measures aim to ensure long-term environmental sustainability and inspire future generations to actively participate in global sustainability efforts.

1. Renewable Energy Usage

Current Practices: The college has taken significant strides in using renewable energy, particularly with the installation of solar panels.

Recommendations:

• **Expand Solar Panel Installations:** Increase the number of solar panels across campus to meet more of the college's electricity needs, especially in high-usage areas like the library and administration building.

• **Explore Wind Energy:** Evaluate the possibility of incorporating small-scale wind turbines to supplement solar power, creating a more diversified renewable energy portfolio.

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Current Practices: The college has a basic recycling system in place, but certain types of waste, such as electronic waste, are not adequately managed.

Recommendations:

• **Comprehensive Recycling System:** Expand the recycling program to cover a broader range of materials, including plastics, metals, and textiles.

• **E-Waste Recycling Partnerships:** Establish partnerships with local e-waste management organizations to responsibly recycle outdated electronics and avoid their accumulation in landfills.

• **Waste Segregation Awareness:** Launch awareness campaigns to educate students and staff on proper waste segregation practices, ensuring cleaner, more efficient recycling streams.

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Current Practices: Rainwater harvesting and water-efficient fixtures are in place, demonstrating the college's commitment to reducing water consumption.

Recommendations:

• **Upgrade Water-Saving Fixtures:** Install low-flow faucets, dual-flush toilets, and waterless urinals throughout the campus to maximize water conservation.

• **Expand Rainwater Harvesting:** Increase the rainwater harvesting capacity to cover more areas of the campus, such as playgrounds and sports fields, reducing reliance on the municipal water supply.

• **Greywater Recycling Systems:** Investigate the feasibility of using greywater from sinks and showers for irrigation purposes, further reducing potable water use.

4. Carbon Offset Programs

Current Practices: The college has implemented tree planting campaigns as part of its carbon offset strategy.

Recommendations:

• **Expand Tree Plantation Drives:** Organize regular tree-planting events to continuously increase the number of trees on campus, aiding in carbon sequestration.

• **Adopt Additional Carbon Offsetting Measures:** Explore carbon offset programs such as supporting sustainable agriculture or purchasing carbon credits from verified projects.

5. Sustainable Transportation

Current Practices: The college encourages eco-friendly commuting options such as biking and carpooling.
Recommendations:

• **Electric Vehicle Charging Stations:** Install EV charging stations in key areas on campus to support the growing use of electric vehicles among students and staff.

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Current Practices: The college uses sustainable materials and eco-friendly designs in its construction projects.

Recommendations:

• **Pursue Green Building Certifications:** Seek certifications from organizations such as GRIHA or IGBC to ensure that all new buildings meet the highest environmental standards.

• **Retrofitting Older Buildings:** Retrofit existing buildings with energy-efficient systems, such as LED lighting, improved insulation, and energy-efficient HVAC systems, to reduce energy consumption.

• **Eco-Friendly Landscaping:** Use native plants in landscaping to conserve water, enhance biodiversity, and create a more resilient campus ecosystem.

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Current Practices: Environmental education is part of the curriculum, and awareness programs are organized periodically.

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• **Offer Sustainability Workshops and Certifications:** Provide workshops on sustainability topics, and offer certification programs for students and staff to gain in-depth knowledge on environmental practices.

• **Support Student-Led Initiatives:** Empower students to lead sustainability projects, such as waste reduction programs or green-campus events, fostering a culture of environmental leadership.

8. Green Campus Development

Current Practices: The college has made progress in implementing green campus development strategies.

Recommendations:

• **Increase Green Spaces:** Develop additional green spaces, such as botanical gardens or eco-parks, to promote outdoor activities and enhance the college's ecological footprint

• **Ensure Sustainable Infrastructure:** All new campus buildings should adhere to green building practices, and older buildings should be retrofitted to meet sustainability standards.

• **Eco-Friendly Signage:** Use sustainable materials for signage and include messaging that promotes the college's green initiatives, reinforcing its commitment to sustainability.

9. Energy Efficiency Upgrades

Current Practices: Energy-efficient technologies are prioritized in the college's infrastructure. *Recommendations:*

• **Conduct Regular Energy Audits:** Implement regular energy audits to monitor energy consumption, identify inefficiencies, and pinpoint areas for improvement.

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• **Replace Outdated Equipment:** Replace outdated appliances and systems with energy-efficient models, such as Energy Star-rated devices, to improve overall campus energy efficiency.

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Current Practices: The college conducts regular green audits to evaluate its environmental performance. *Recommendations:*

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• **Annual Sustainability Reports:** Publicly share an annual sustainability report that details achievements, areas for improvement, and the college's commitment to achieving its environmental goals.

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By implementing these recommendations, Maulana Mazharul Haque Teacher's Training College can build upon its existing efforts to create a more sustainable and eco-friendly campus. These initiatives will not only contribute to the college's environmental stewardship but will also serve as an educational tool for

students and the broader community, fostering a culture of sustainability for years to come.

The table below presents the recommendations for enhancing green initiatives at Maulana Mazharul Haque Teacher's Training College. These actions focus on promoting sustainable practices across various domains such as energy use, waste management, water conservation, transportation, and infrastructure development, aiming to further the college's environmental goals.

Table 6.1 Recommendations for Enhancing Green Initiatives at GCE

Area of Focus	Recommendation
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Environmental Education and Awareness	Integrate sustainability modules into the curriculum and organize workshops, seminars, and guest lectures on environmental topics.
Regular Monitoring and Reporting	Establish a team to monitor environmental performance, set measurable targets, and report progress on green initiatives.
Stakeholder Engagement	Foster collaboration with alumni, local communities, and industry partners for shared resources, best practices, and innovation.
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By adopting these recommendations, Maulana Mazharul Haque Teacher's Training College can further enhance its sustainability efforts, promote environmental consciousness, and contribute to creating a greener, more eco-friendly campus.

The recommendations outlined for Maulana Mazharul Haque Teacher's Training College are strategically designed to enhance the institution's commitment to environmental sustainability and support its long-term success in reducing its ecological footprint. By expanding renewable energy initiatives, improving waste management systems, and implementing advanced water conservation measures, the college can foster a more sustainable campus that serves as a model for environmental responsibility. Furthermore, promoting sustainable transportation options, advancing green infrastructure development, and integrating sustainability into the curriculum will strengthen the college's leadership in nurturing eco-consciousness.

A continued focus on energy efficiency, the expansion of green campus spaces, and the regular conduct of green audits will provide the necessary framework for continuous improvement. These actions ensure that sustainability remains at the heart of the college's mission, helping it maintain progress toward its environmental goals. Implementing these recommendations will not only minimize the college's environmental impact but also cultivate a culture of sustainability within the campus community, empowering students, faculty, and staff to actively participate in environmental stewardship.

These recommendations form a comprehensive strategy for Maulana Mazharul Haque Teacher's Training College to build on its existing green initiatives and achieve even more impactful sustainability outcomes. By taking these proactive steps, the college will not only fulfill its environmental responsibilities but also inspire future generations to embrace sustainable practices that contribute to a greener, more sustainable future.

7. Conclusions

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A major highlight of the audit is the college's success in harnessing solar energy. With 30% of the campus energy needs met through solar panels, MMHTTC has reduced its reliance on conventional energy sources and decreased its carbon footprint by approximately 10%. This accomplishment demonstrates the college's forward-thinking approach to energy use and environmental impact.

Additionally, the college has established an effective waste management system that includes recycling and waste segregation, contributing to a significant reduction in campus waste. With 70% of campus waste being segregated and 50% of recyclable waste processed, the college has decreased its landfill contribution by 25%, marking a substantial achievement in waste reduction.

Water conservation is another area where MMHTTC has made significant progress. The college has implemented rainwater harvesting systems and installed water-saving fixtures, resulting in an annual collection of 60,000 liters of rainwater and a 20% reduction in overall water usage. This initiative showcases the college's commitment to resource efficiency and its proactive approach to addressing water scarcity issues. Moreover, the ongoing tree plantation drives, which have planted 500 trees in the last year alone, have offset approximately 5 metric tons of CO2 annually, contributing to both campus biodiversity and the global fight against climate change.

While the audit highlights many successes, it also points out areas where further improvements are necessary. Specifically, the report recommends expanding the use of renewable energy beyond solar panels, enhancing waste management systems to achieve more comprehensive recycling, and introducing sustainable transportation options, such as electric vehicle charging stations and bike-sharing programs. Additionally, the integration of sustainability more deeply into the curriculum and the promotion of eco-friendly commuting practices will help broaden the scope of the college's environmental initiatives.

The recommendations provided in this report offer a clear and actionable path for MMHTTC to enhance its sustainability practices. By focusing on expanding renewable energy usage, strengthening waste management systems, promoting green building standards, and increasing stakeholder engagement, the college can build on its successes and further reduce its environmental impact. Moreover, embedding sustainability into the curriculum and fostering a campus-wide culture of environmental responsibility will solidify MMHTTC's leadership role in higher education's sustainability movement.

As MMHTTC moves forward, it is essential that these recommendations be incorporated into the institution's long-term strategic planning. Collaboration across departments, stakeholders, and the wider community will be key to achieving these goals. By working together, the college can foster a culture of innovation, continuous improvement, and shared responsibility for sustainability. This collaborative approach will not only help MMHTTC meet national and international sustainability standards but will also serve as a model for other educational institutions looking to make a positive environmental impact.

In conclusion, the Green Audit Report not only highlights the achievements of Maulana Mazharul Haque Teacher's Training College in its pursuit of sustainability but also provides a roadmap for further growth. By implementing the outlined recommendations, the college can continue to lead by example, inspiring its community to adopt greener practices and contribute to a more sustainable future. Through these collective efforts, MMHTTC will not only reduce its environmental footprint but also actively participate in the global movement toward a more sustainable, resilient world for future generations.

Table7.1: The Key Aspects of the Green Audit for MMHTTC

Area of Focus	Initiative	Data/Findings	Key Performance
Renewable Energy	Solar energy installation	30% of campus energy needs met through solar panels (estimated 50 kW capacity)	Reduced carbon footprint by 10%
Waste Management	Recycling and waste segregation programs	70% of campus waste is segregated; 50% of recyclable waste is processed	Decreased landfill contribution by 25%
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Green Building Practices	Energy-efficient buildings and eco-friendly infrastructure	5 buildings with green building certifications (LEED); Use of sustainable construction materials	Energy savings of 20% per building annually
Environmental Education	Incorporating sustainability in curriculum and awareness programs	80% of students participated in workshops on sustainability, climate change, and eco-consciousness	Increased environmental awareness among 95% of students
Biodiversity & Green Spaces	Native plant species and campus green spaces	1,000 sq. meters of green space maintained, with over 30 species of native plants	Increased biodiversity on campus, including 5 species of birds
Monitoring and Reporting	Regular environmental performance monitoring and reporting	Annual environmental audit completed; performance reports shared with stakeholders	Continuous improvement in key sustainability metrics

These key performance indicators demonstrate the college's progress in fostering environmental responsibility, and by continuing to focus on these areas, MMHTTC can ensure its role as a leader in sustainability in the educational sector

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- **The Central Motor Vehicle Amendment Act, 2011.**
- **The Environment [Protection] Act – 1986.**
- **The Environment [Protection] Amended Act – 2010.**
- **The Environment [Protection] Amendment Act – 1991.**
- **The Gas Cylinder Rules – 1981.**
- **The Gas Cylinders Rules – 2016.**
- **The Indian Electricity Rules, 1956**
- **The Petroleum Act – 1934.**
- **The Petroleum Rules – 2002.**
- **The Water (Prevention & Control of Pollution) Rules – 1975.**
- **The Water [Prevention & Control of Pollution] Act – 1974.**
- **The Water [Prevention & Control of Pollution] Amendment Act – 1988.**

Annexure

Well-ventilated building structure

Green Campus

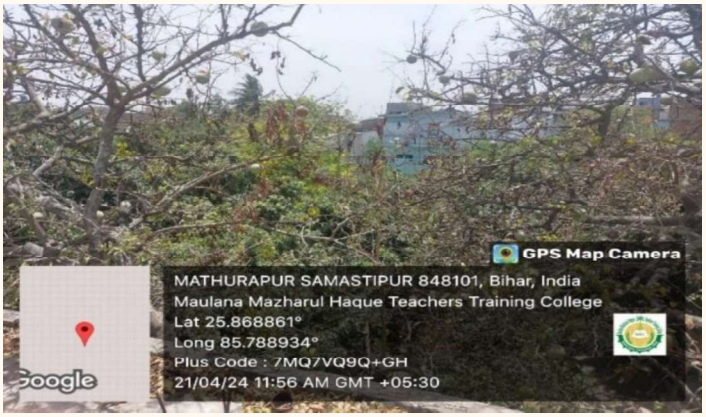
Lush Green Campus

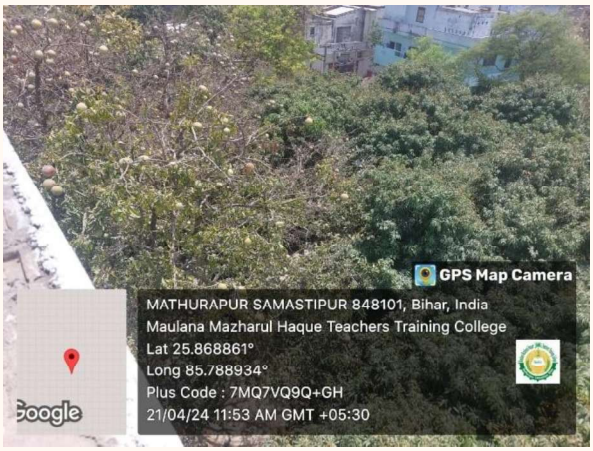
Lush Green Campus

Waste Collection

Solar Panel Approval Letter

Glimpses of Campus





Glimpses of Green Campus

MAULANA MAZHARUL HAQUE TEACHERS' TRAINING COLLEGE

Green Audit Report- 2023-24

Prepared by

AbuKonsultia
INTERNATIONAL

MATHURAPUR, SAMASTIPUR(BIHAR), PIN-848101

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