



**MANAV RACHNA  
UNIVERSITY**

Declared as State Private University vide Haryana Act 26 of 2014



**11 SUSTAINABLE CITIES  
AND COMMUNITIES**



# PROGRESS REPORT 2022-23

**Manav Rachna University**

Declared as State Private University vide Haryana  
Act 26 of 2014





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# 1. Preamble

Manav Rachna University (MRU) is dedicated to advancing Sustainable Development Goal 11, which aims to make cities and human settlements inclusive, safe, resilient, and sustainable. MRU fosters an environment where students and researchers actively engage in addressing urbanization challenges, promoting sustainable infrastructure, and driving innovation in smart technologies. With programs in Computer Science and Engineering, Artificial Intelligence and Machine Learning, Cyber Security & Threat Intelligence, Data Analytics, Mechanical Engineering, Smart Manufacturing & Automation, Electronics and Communication Engineering, and Robotics & Artificial Intelligence, MRU equips students with the skills and knowledge needed to build smart, resilient cities that prioritize sustainability. Through community outreach and academic initiatives, MRU contributes to creating inclusive urban spaces that enhance quality of life for current and future generations, reinforcing its commitment to sustainable cities and communities.



## 2. Teaching And Learning

At Manav Rachna University (MRU), educators emphasize the importance of urban sustainability and inspire students to explore innovative solutions for creating inclusive, environmentally friendly, and resilient cities. By integrating Sustainable Development Goal 11 into the curriculum, MRU prepares future leaders with the knowledge and skills required to contribute meaningfully to the sustainable development of cities and human settlements, advancing this essential global objective.

MRU's curriculum is designed to enable students to address environmental, social, and economic aspects of sustainability, particularly through the lens of technology and smart infrastructure. Students engage with topics such as energy-efficient systems, sustainable technology integration, materials with reduced environmental impact, and IoT-driven solutions for urban development. They are encouraged to innovate in ways that promote resource conservation, resilience, and inclusivity within urban spaces. Practical learning opportunities, such as internships and projects, allow students to gain hands-on experience in applying sustainable practices. Additionally, students benefit from industrial

visits, awareness campaigns, workshops, and seminars conducted by leading academicians and industry professionals, enhancing their knowledge and practical skills in sustainable urban development.

### 3. MRU State of Art Infrastructure

The **Manav Rachna University (MRU)** campus is thoughtfully designed to harmonize with its natural surroundings, providing an inspiring environment that enhances the academic journey for both students and faculty. The lush green campus, nestled in a scenic location, offers a refreshing ambience that balances the demands of academia with spaces for relaxation and recreation. The campus includes well-distributed facilities such as sports complexes, cultural zones, and refreshment kiosks, creating a supportive environment for students to unwind and recharge amidst a landscaped, secure, and vibrant setting.



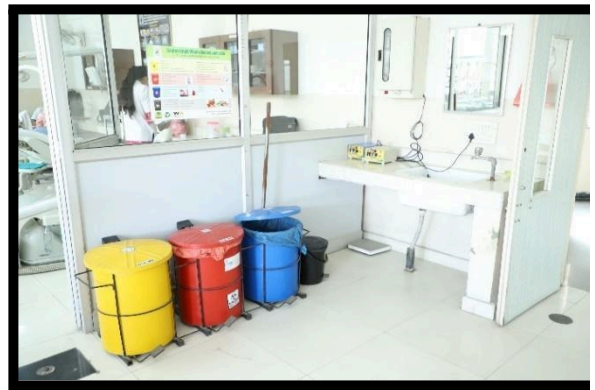
### Bird's Eye View of MRU Green Campus

**Geo Coordinates from Google maps: 28.4504295,77.2857466**

Manav Rachna University has undertaken various Green Initiatives that reflect its commitment to environmental sustainability and responsible resource management:

- Solid Waste Management:** The university collects paper waste for recycling, with recycled products donated to NGOs. Horticultural and food waste undergo composting for campus use, while digitization efforts reduce paper dependency in attendance and assessment records. Additionally, MRU promotes e-books and e-journals to minimize printed

material, encourages food waste awareness, and fosters recycling habits. Workshops are also held on waste management, and single-use plastic is banned across the campus.



- **Water Management:** MRU employs measures to prevent water wastage, including maintaining leak-proof fixtures and prioritizing Indian-style toilets, which require less water. Manav Rachna University (MRU) has a comprehensive approach to managing water resources, addressing both

consumption needs and conservation practices. The primary source of water on campus is through bore wells, meeting a range of requirements across various facilities. As infrastructure and personnel grow, water conservation will become increasingly critical to ensure sustainability.

- **Water Consumption Analysis:** MRU's current monthly water consumption, amounting to 1397.35 kiloliters (KL), is distributed as follows:
  - **Potable Water Requirement:** 68.62 KL
  - **Kitchen & Toilets:** 451.20 KL
  - **Gardening:** 307.49 KL
  - **Hostels:** 407.70 KL
  - **Other Activities:** 162.34 KL
- **Water Storage Infrastructure:** To support the campus's needs, MRU has installed a series of water storage tanks with a combined capacity of 124,000 liters, comprising:
  - 18 tanks of 5000 liters each, totaling 90,000 liters
  - 2 tanks of 4000 liters each, totaling 8000 liters
  - 12 tanks of 2000 liters each, totaling 24,000 liters



- 2 tanks of 1000 liters each, totaling 2000 liters
- **Water Conservation Techniques:** MRU has adopted several water-saving measures to optimize its usage and minimize wastage:
- **Controlled Valves:** Installed within the water supply system to prevent overflow.
- **Close Supervision:** Regular monitoring of the water supply system ensures efficiency and early detection of leaks or faults.
- **Sensor-Based Taps:** Installed to avoid unnecessary water flow, especially in high-use areas.
- **Sprinkler System for Gardening:** Utilized to efficiently water green spaces, reducing overall water usage.
- **Research and Development Initiatives:** MRU actively promotes R&D in water conservation and purification, aiming to develop new solutions for sustainable water management.

- **Awareness Programs:** Regular programs for students and staff are organized to promote water conservation practices, emphasizing individual responsibility in preserving this vital resource.
- These efforts underscore MRU's commitment to sustainable water management, balancing its operational needs with effective conservation practices to secure resources for the future.



- **E-waste Management:** A dedicated storage area holds e-waste until its scheduled disposal through auctions to certified agencies, ensuring safe and responsible management of electronic waste. We have tied up with Namo e-Waste Management Pvt. Ltd., Faridabad. MRU organizes E-Waste Collection Drive time and again, reinforcing its commitment to promoting

environmental sustainability and raising awareness about the hazards of e-waste.



The faculty of the department encourages students to recycle and reuse e-waste and build projects and products useful in daily life

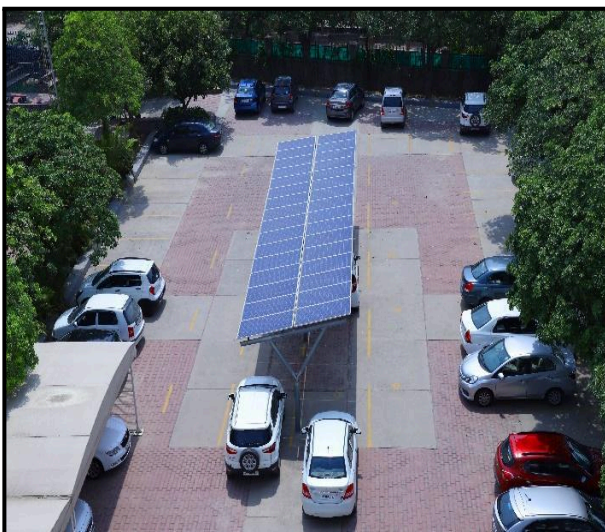


A humanoid robot model built from E-Waste (Motherboards, RAM chips, PCBs, etc.)

- **Rainwater Harvesting:** With six rainwater harvesting pits, MRU supports groundwater recharge, and stored rainwater is utilized for gardening, contributing to water conservation efforts.



- **Renewable Energy:** Solar PV installations (totaling 93.32 kW) on various buildings—K Block (17.28 kW), J Block (44.4 kW), I Block (20.68 kW), and N Block (15.36 kW)—supply clean energy to the campus. Additionally, solar lights, heaters, and geysers are in use.



- **Air Pollution Reduction:** To minimize emissions, students' personal vehicles are prohibited on campus, promoting cleaner air quality within university grounds. Greenery across the campus and planted trees for reduced green house gases in to the environment.



- **Plantation Drives:** MRU organized tree plantation activities across several locations, including Sector 16 and Sector 45 in Faridabad, and Kanha Ashram in Hyderabad, fostering community involvement in reforestation efforts.



- Environment Committee Initiatives:** The Environment Committee engages students in environmental awareness through creative competitions, such as the "Save the Vanishing Treasures" poster and slogan competition, a poetry contest, and poster-making events on World Environment Day. Additionally, the committee led a cleanliness drive at Faridabad Railway Station, and a seed collection drive to promote biodiversity and environmental stewardship.



Manav Rachna University's commitment to sustainability through impactful green initiatives has earned it certification from EHS Alliance for completing the Green Audit, Environmental Audit, and Energy Audit of the institution. This recognition underscores MRU's dedication to environmental responsibility, ensuring eco-friendly campus practices, resource conservation, and energy efficiency, further reinforcing its role as a leader in sustainable education and community practices. The certificates obtained are as follows:

## A. Green Audit

 EHS  
alliance

# CERTIFICATE

PRESENTED TO

## MANAV RACHNA UNIVERSITY

Sector 43, Aravali Hills, Delhi-Surajkund Road, Faridabad, Haryana 121004

Has been assessed by EHS Alliance Services for the comprehensive study of environmental impacts on institutional working framework to fulfill the requirement of

## GREEN AUDIT

The green initiatives carried out by the institution have been verified on the report submitted and was found to be satisfactory.

The efforts taken by the management and the faculty towards environment and sustainability are appreciated and noteworthy.

  
SIGNATURE




01.02.2023  
DATE OF AUDIT

EHS ALLIANCE SERVICES, PLOT A-72, SURYA VIHAR, GURUGRAM, 122001  
WWW.EHSALL.IN | BUSINESS@EHSALL.IN | EHSALLIANCE@GMAIL.COM



## B. Energy Audit

 EHS  
alliance

# CERTIFICATE

PRESENTED TO

## MANAV RACHNA UNIVERSITY


Sector 43, Aravali Hills, Delhi-Surajkund Road, Faridabad, Haryana 121004


Has been assessed by EHS Alliance Services for the comprehensive study of Energy Audit on institutional working framework to fulfill the requirement of

## ENERGY AUDIT

The energy-saving initiatives carried out by the University have been verified in the report submitted and were found to be satisfactory.

The efforts taken by management and faculty towards all types of energy used in the University and sustainability are highly appreciated and noteworthy.

  
SIGNATURE



01.02.2023  
DATE OF AUDIT

EHS ALLIANCE SERVICES, PLOT A-72, SURYA VIHAR, GURUGRAM, 122001  
WWW.EHSALL.IN | BUSINESS@EHSALL.IN | EHSALLIANCE@GMAIL.COM

## C. Environment Audit

 **EHS**  
alliance

# CERTIFICATE

PRESENTED TO

## MANAV RACHNA UNIVERSITY

Sector 43, Aravali Hills, Delhi-Surajkund Road, Faridabad, Haryana 121004

Has been assessed by EHS Alliance Services for the comprehensive study of environmental impacts on institutional working framework to fulfill the requirement of

## ENVIRONMENT AUDIT

The environment legal compliances and initiatives carried out by the University have been verified on the report submitted and was found to be satisfactory.

The efforts taken by management and faculty towards environment and sustainability are highly appreciated and noteworthy.

  
SIGNATURE



01.02.2023  
DATE OF AUDIT

EHS ALLIANCE SERVICES, PLOT A-72, SURYA VIHAR, GURUGRAM, 122001  
WWW.EHSALL.IN | BUSINESS@EHSALL.IN | EHSALLIANCE@GMAIL.COM

## 4. Research Publications aligned with SDG11(Journal/Book/Book Chapters)

(i). Neha Gupta, Chand P. Saini, Amit Dangi and Md. Tanwir Akhtar, **“Unified AHP-TOPSIS and DEA technique for the adoption and performance evaluation of green transportation alternatives in India”**, *International Journal of Vehicle Design*, Vol. 88, No. 2-4, pp 260-282, 2022. Doi: 10.1504/IJVD.2022.127019.

This research aligns with Sustainable Development Goal 11 by promoting sustainable transportation solutions that contribute to making cities more eco-friendly, resilient, and inclusive. The focus on electric vehicles (EVs) addresses urban sustainability by reducing emissions and noise pollution, key factors in enhancing the quality of urban life. By evaluating EV performance through multi-criteria analysis, this study provides valuable insights into factors influencing EV adoption and use. The ranking of EVs based on the perspectives of both dealers and users contributes to a comprehensive understanding of sustainable transport needs, supporting

SDG 11's goal to foster sustainable cities and communities with reduced environmental impact.

(ii). Jaya Tuteja, Aparna Vyas, and Arpit Sand, ***"Utility of Nanomedicine and Nanocarriers for Noninfectious Disease Treatment"*** in the book *Nanotechnology for Drug Delivery and Pharmaceuticals*, Academic Press, 2023, pp. 207-223, ISBN 9780323953252, doi:10.1016/B978-0-323-95325-2.00014-6.

The book chapter titled *"Utility of Nanomedicine and Nanocarriers for Noninfectious Disease Treatment"* contributes to Sustainable Development Goal 11 (SDG 11) by enhancing urban health resilience and supporting sustainable city living. Nanomedicine's targeted therapies improve treatment effectiveness for prevalent noninfectious diseases in urban areas, such as cancer, cardiovascular diseases, and diabetes, which can alleviate the healthcare burden on densely populated cities. This advanced approach promotes sustainable healthcare by minimizing pharmaceutical waste through efficient drug delivery, reducing environmental impact—a key aspect of SDG 11's goal to lessen cities' ecological footprints. Additionally, nanocarriers facilitate less invasive, more accessible

treatments, expanding urban residents' access to advanced healthcare while potentially decreasing the need for frequent hospital visits. By streamlining health infrastructure, nanomedicine fosters more resilient urban health systems, aligning with SDG 11's vision of inclusive, sustainable, and health-focused communities.

(iii). Jaya Tuteja, and Aparna Vyas, "***Progressive Approach of SAPs in Disposable Hygiene Industry***" in the book *Properties and Applications of Superabsorbent Polymers-Smart Applications with Smart Polymers*, Springer, 2023, pp. 171.

The book chapter "*Progressive Approach of SAPs in Disposable Hygiene Industry*" links to Sustainable Development Goal 11 (SDG 11) by addressing the environmental challenges posed by disposable hygiene products, which are widely used in urban settings. Disposable items like diapers and sanitary napkins, made with superabsorbent polymers (SAPs) such as sodium polyacrylate, provide essential hygiene benefits for diverse groups, including the elderly, women, and children. However, these products are a significant environmental concern due to their non-degradable polymeric composition, leading to accumulation in landfills and environmental

pollution. The chapter discusses innovative solutions, such as the development of cellulose-based biodegradable hydrogels, which offer a sustainable alternative to synthetic SAPs. These biodegradable hydrogels not only serve the hygiene industry but also have applications in biomedical, agricultural, and pharmaceutical fields. By promoting eco-friendly materials, the chapter supports SDG 11's goal of reducing urban waste and fostering sustainable, resilient urban communities.

## **5. Prominent Workshops/ Seminars/Training Programmes Organized for Students and Faculty Members**

### **(i). Nature walk at SEC 15 Mini Forest Faridabad on 5<sup>th</sup> September 2022**

The nature walk organized by Dr. OP Bhalla Foundation and Manav Rachna Centre for Peace and Sustainability served Distributing plants and taking

environment pledge with students as an eye-opening experience for the participants. It allowed them to connect with nature, gain knowledge about local ecosystems, and appreciate the need for environmental conservation. Such initiatives play a crucial role in nurturing a sense of responsibility and enthusiasm for preserving our natural heritage among future generations.

The students who participated in the nature walk were captivated by the beauty and serenity of the Mini Forest. They expressed their amazement at the diverse plant and animal life thriving within the area. The experience left them with a renewed enthusiasm for environmental conservation and sustainable practices. Witnessing the ecosystems firsthand reinforced the importance of preserving and protecting nature.



Students hugging the trees in order to consider them as friends.

**(ii). G2- Green Grah Plastic Collection Drive Dr. OP Bhatta Foundation**

The primary goal of the Green Grah Plastic Collection Drive is focused on the collection of recyclable plastics from the community, which are intended to be used in developing eco-friendly benches for local public spaces. Through participation in this drive, contributions are made towards reducing plastic waste while supporting the creation of sustainable seating areas for community use.



**A bench made from recycled plastic waste**



### **(iii). Eco-Friendly Bricks Initiative on Aug 16, 2022**

On August 16, 2022, Team Foundation, in collaboration with students of Manav Rachna University, organized a creative initiative focusing on eco-friendly solutions through the use of Eco-Bricks. This effort was aimed at promoting sustainability on campus by repurposing plastic waste into useful and durable objects.

During the drive, three dedicated students used Eco-Bricks to craft various functional items, including dustbins, sitting stools, and tables. These items have been strategically placed across the MRU campus, particularly in high-traffic areas such as between E and F Blocks and near B Block, to encourage widespread use and visibility. This initiative not only contributes to reducing plastic waste but also serves as a reminder of the importance of sustainability practices in everyday life.

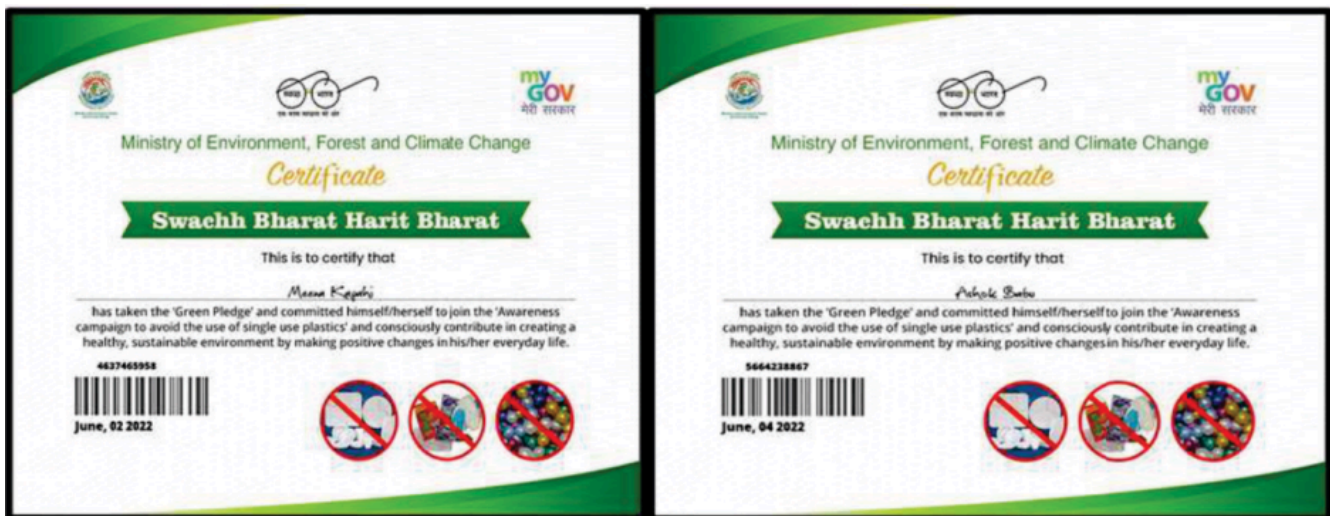


**(iv). Awareness drive for Swachh Bharat Harit Bharat Green Pledge**

Manav Rachna University in Collaboration with the Hazardous Substance Waste Management Division, MoEF&CC GOI, organized awareness drive on 9<sup>th</sup> July 2022 to promote Swachh Bharat Harit Bharat Green Pledge & Ban on Single Use Plastic at Brahmakumaris Centre, Sector 8, Faridabad (Haryana). Swachh Bharat Harit Bharat Green Pledge ceremony was organized for the students and faculty members and community in the offline and online mode. A google link for registration and Green Pledge was shared with the various groups in contact apart from the faculty and students.



### Awareness drive for Swachh Bharat Harit Bharat Green Pledge



### Swachh Bharat Harit Bharat Green Pledge Certificate obtained by few Volunteers

- (v). **Solid Waste Management and World Environment Day Celebration at Jagriti Sewa Trust on July 6, 2022**

An awareness drive focusing on Solid Waste Management and World Environment Day was organized at Jagriti Sewa Trust on July 6, 2022. This event was a collaborative effort between Manav Rachna University (MRU) and the Hazardous Substances Division, Ministry of Environment, Forest, and Climate Change, under the Central Sector Scheme. The event aimed to raise awareness about the pressing issues of solid waste pollution and environmental conservation.

- **Activities and Competitions**

The celebration featured interactive competitions, including slogan writing and drawing contests centered on the themes of reducing plastic usage, solid waste management, and environmental preservation. These activities were designed to engage young participants and help them express their understanding of environmental issues creatively. Approximately 112 children from local schools and communities participated enthusiastically. They created compelling slogans and artwork that highlighted the need to reduce plastic waste and adopt sustainable practices.

- **Pledge to Say No to Plastics**

As a highlight of the event, all participants collectively took a pledge to "Say No to Plastics." This pledge reinforced the commitment to reduce single-use plastics and make conscious efforts to protect the environment.

- **Impact**

The event not only educated children on the importance of managing waste responsibly but also empowered them to take action within their communities. By focusing on the younger generation, the awareness drive hopes to inspire long-term, positive change in attitudes toward waste management and environmental conservation.





**MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE.**

BUILDING SUSTAINABLE CITIES: TOGETHER WE THRIVE. SDG DRIVES! WE'RE BUILDING INCLUSIVE, RESILIENT, AND VIBRANT URBAN SPACES WHERE PEOPLE FLOURISH, NATURE THRIVES, AND COMMUNITIES UNITE TO SHAPE A BRIGHTER FUTURE. JOIN US PAVING THE PATH TO SUSTAINABLE CITIES AND SUSTAINABLE LIVES."



# Manav Rachna University

(established vide Haryana State Legislature Act No 26 of 2014 & under Section 2(f) of UGC Act 1956)  
 Delhi-Surajkund Road, Aravali Hills, Sector 43, Faridabad, Haryana 121004