Indian Institute of Technology, Roorkee

SUSTAINABILITY REPORT 2025

A commitment to sustainability



GREEN COMMITTEE, IIT ROORKEE



GREEN COMMITTEE

IIT ROORKEE

About The Green Committee

The Green Committee of the Indian Institute of Technology Roorkee (IITR) serves as the principal institutional body responsible for guiding, implementing and monitoring sustainability initiatives across the campus. The committee was established in February 2014, following the Green Campus directive issued by the IIT Council in 2013. The committee formalised IIT Roorkee's commitment to environmental stewardship, climate responsibility and sustainable campus development. The Green Committee has functioned as a strategic and governance platform to integrate sustainability into institutional planning, infrastructure development, operations and community engagement. The first formal meeting of the Committee was held on 17 February 2014, marking the beginning of a structured and accountable approach to campus sustainability at IIT Roorkee.

The committee operates under the leadership of the Director of IIT Roorkee and comprises representatives from faculties and students drawn from different departments. This interdisciplinary composition ensures that sustainability decisions are technically sound, administratively feasible and socially inclusive. The committee also works in coordination with institutional bodies to translate policy intent into measurable actions. Regular meetings are conducted to review progress, evaluate performance indicators and propose new initiatives aligned with emerging sustainability challenges.

The committee envisions IIT Roorkee as a model sustainable campus that integrates environmental responsibility with academic and technological excellence. Its mandate includes implementing the IIT Council's Green Agenda, integrating sustainability into campus planning and infrastructure, promoting efficient use of energy and water, reducing greenhouse gas emissions, encouraging sustainable mobility, strengthening waste management systems, enhancing biodiversity, and fostering environmental awareness across the Institute community.

Members, Green Committee

Prof. K.K. Pant (Chairman, Green Committee), Director, IIT Roorkee
Prof. Bhanu Prakash Vellanki (Convenor, Green Committee), Department of Civil Engineering

1.1. Institute Infrastructure and Facilities Committee (Ex- Officio)

Dean, Infrastructure
Dean, Saharanpur Campus
ADOSW - Bhawan and Mess
Associate Dean Infrastructure – Electrical & AC
Institute Engineer
Institute Architect

1.2. Faculties

Prof. Vimal Kumar, Department of Chemical Engineering
Prof. Pratham Arora, Department of Hydro & Renewable Energy
Prof. Sparsh Mittal, Department of Electronics & Communication Engineering
Prof. Saurabh Vijay, Department of Civil Engineering
Prof. Kritika Kothari, Department of Water Resources Development & Management

1.3. Students

General Secretary, Hostel Affairs-UG, SAC (Ex-Officio)
Mr. Abhisekh Kumar Maurya, MTech- II, Department of Hydro & Renewable Energy
Mr. Dhananjay Kumar, MTech- II, Department of Hydro & Renewable Energy

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1. Campus Overview



Figure 1: Main building, IIT Roorkee

The Indian Institute of Technology Roorkee is one of the oldest and largest institutions of technical education in India. It is an institute of national importance with a strong academic and residential ecosystem. The institute comprises 23 academic departments, 9 academic centres, 7 centres of excellence, 8 academic service centres, and 6 supporting units, reflecting its multidisciplinary academic structure.

The institute caters to a vibrant academic community, with a total student population of 11,068, comprising 8,242 male students (74.5%) and 2,826 female students (25.5%) across undergraduate, postgraduate, and doctoral programs. To support this growing academic community, IIT Roorkee operates across three campuses: Roorkee (Uttarakhand), Saharanpur, and Greater Noida (Uttar Pradesh), with a combined total area of approximately 346.02 acres. The expansion to additional campuses has enabled the Institute to accommodate increasing student intake while maintaining academic and infrastructural quality.

The institute provides extensive residential facilities, including 10 boys hostels, 3 girls hostels, 6 hostels for married students and 1 co-ed hostel. A large residential area is also designated for faculty and staff, supported by essential community infrastructure such as a hospital, banks, post office, schools, and a community centre, all located within the campus.

The institute offers well-developed recreational and sports infrastructure, including facilities for badminton, tennis, squash, and basketball, along with full-size competitive grounds for athletics, football, hockey, and cricket. Indoor sports facilities, an Olympic-size swimming pool, and a well-equipped gymnasium further contribute to the overall well-being of students and staff.

For visiting dignitaries and guests, the institute provides four guest houses and one visitor's hostel within the campus. The campus environment is inclusive and culturally diverse, with dedicated spaces for different faiths, including a temple, mosque, and church.

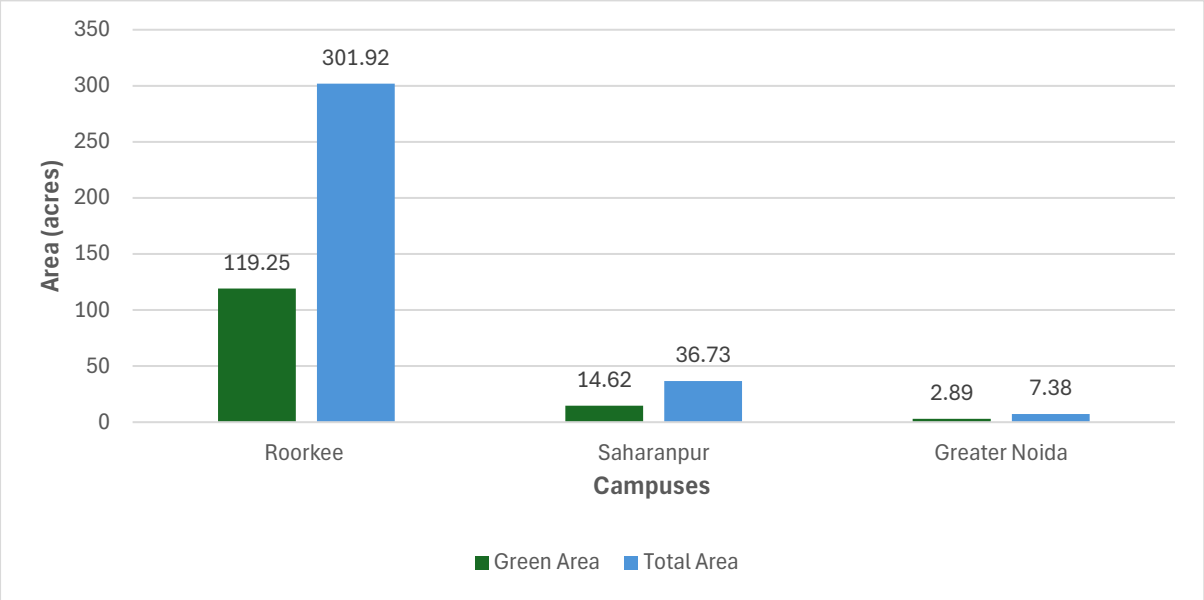


Figure 2: IITR Green Area across all campuses

The IIT Roorkee operates across three campuses with a well-balanced distribution of built-up and green spaces, reflecting its commitment to environmental sustainability and ecological preservation. Figure 2 presents the distribution of total and green area across the Roorkee, Saharanpur, and Greater Noida campuses, indicating that the Roorkee campus constitutes the largest share of both total land area and green cover.

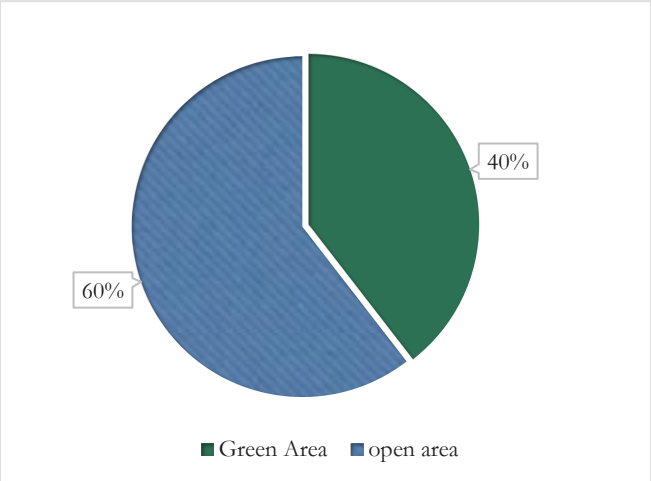


Figure 3: IITR Land Use

Across all campuses, a substantial proportion of land is dedicated to green and open spaces, including lawns, tree cover, and landscaped areas. Figure 3 illustrates the overall land-use distribution at the Roorkee campus, highlighting the proportion of green and open areas relative to built-up spaces. This allocation supports ecological balance and contributes to maintaining a sustainable campus environment.

The presence of extensive green spaces plays a key role in enhancing biodiversity, improving microclimatic conditions, and supporting overall environmental quality. The integrated approach to land use reflects the Institute's focus on maintaining a balance between infrastructure development and environmental conservation.

1.1. Sustainability Vision

The institute envisions a campus that integrates academic excellence with environmental responsibility, striving to become a model for sustainable development, resource efficiency, and climate-conscious institutional practices. The institute is committed to embedding sustainability across its operations, infrastructure, research, and education, in alignment with national priorities and global sustainability frameworks. In this direction, the Institute aligns its initiatives with the United Nations Sustainable Development Goals (SDGs) and has set its own target of achieving net-zero emissions by 2060, advancing beyond India's national commitment of 2070.

To drive this vision, the institute has established a Green Office, functioning as an interdisciplinary platform with representation from key centres, departments, technical experts, and the academic community. Located within departments engaged in sustainable development and climate engineering, the office ensures access to technical expertise and promotes a participatory and transparent approach by engaging faculty, students, and stakeholders. Chaired by the Director, it provides institutional leadership in guiding, overseeing, and reviewing the implementation of sustainability initiatives and green agenda guidelines.

The institute's sustainability efforts are guided by a comprehensive framework that focuses on developing a Green Policy and vision document, establishing baseline assessments of carbon emissions, water usage, waste generation, and resource consumption, and implementing targeted interventions to reduce environmental impact. These include the adoption of renewable energy systems, water conservation measures, waste management solutions, and resource-efficient technologies, supported by the phased implementation of a structured Green Action Plan.

A strong emphasis is placed on monitoring, reporting, verification, and continuous evaluation, ensuring accountability and measurable progress. Sustainability is also being integrated into education and research, encouraging innovation and awareness among students and faculty, and fostering a culture of environmental responsibility across the campus community.

The institute is committed to reducing its carbon and water footprints, enhancing water quality, and minimising waste generation through systematic planning and management. Its master planning approach ensures that infrastructure development aligns with environmental norms and green building standards, with a focus on preserving permanent green areas and promoting ecologically sensitive design. All new developments are undertaken through a consultative process, reinforcing transparency and stakeholder engagement.

A special emphasis is placed on biodiversity conservation, recognising the campus as a shared habitat for diverse flora and fauna. In this direction, the Indian Institute of Technology Roorkee has undertaken targeted plantation and afforestation initiatives to enhance green cover and ecological resilience across the campus. As part of these efforts, a Miyawaki forest has been developed over an area of approximately 330 sq. m, comprising around 1,200 saplings representing nearly 60 species, enabling the growth of dense and self-sustaining vegetation. Figure 4 highlights the designated Miyawaki forest area, which improves local microclimatic conditions, including temperature regulation. Additionally, tree plantation drives across the campus have resulted in the planting of approximately 1100 saplings across 30 species, contributing to enhanced green cover and ecological resilience. The Institute also promotes

scientific documentation and protection of biodiversity, involving experts and the student community as part of an educational and sensitisation process.

In parallel, efforts are directed toward the creation and restoration of water bodies, strengthening rainwater harvesting systems, and improving groundwater recharge, further supporting the campus ecosystem.



Figure 4: Miyawaki Forest

1.2. Student Population

The total student population at the Indian Institute of Technology Roorkee during the reporting period comprises undergraduate, postgraduate, and doctoral scholars, with a majority of students enrolled in undergraduate programs. The overall student composition reflects a higher proportion of male students compared to female students across academic levels.

Program-wise distribution indicates that undergraduate programs account for the largest share of the student population, followed by doctoral and postgraduate programs. Doctoral programs constitute a significant component of the academic ecosystem, contributing to research and innovation activities within the Institute.

Figure 5 presents the distribution of students across academic programs and gender categories. The data indicate a relatively higher proportion of female participation in doctoral programs compared to other academic levels, reflecting gradual progress towards improved gender diversity within the campus community.

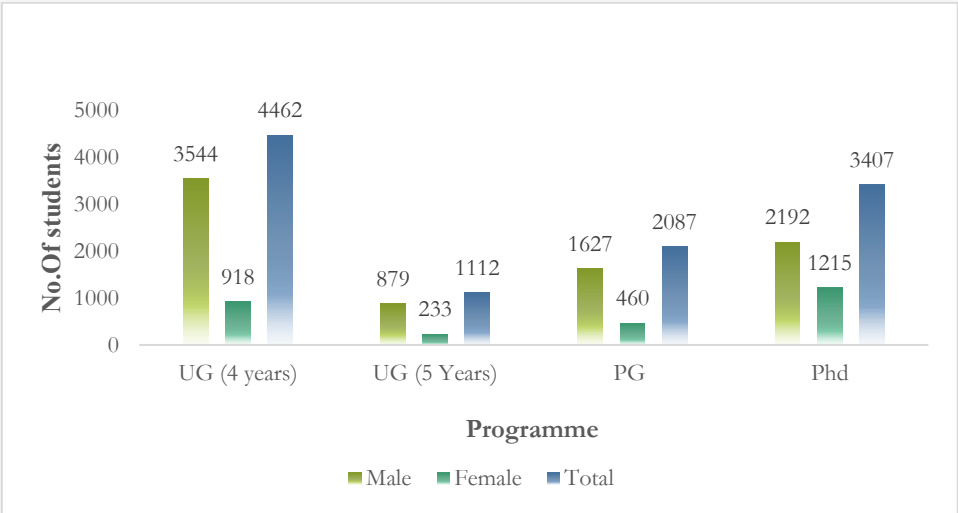


Figure 5: Student Population

1.3. Staff and Faculties

The Institute maintains a well-structured and diverse human resource base to support its academic, administrative, and operational functions. It is supported by 557 faculty members, who form the core of its academic and research ecosystem, contributing to teaching, innovation, and knowledge dissemination across disciplines.

In addition to faculty, the Institute has a substantial workforce across administrative and technical categories. Under Group B, there are 89 ministerial staff and 87 technical staff, supporting administrative operations and technical services. The Group C category comprises 145 ministerial staff and 126 technical staff, playing a crucial role in day-to-day institutional functioning and service delivery. Further, 102 personnel under Group C-MTS (Multi-Tasking Staff) contribute to essential support services, ensuring smooth campus operations. The Institute also maintains a Y Pool of 43 personnel, which provides additional operational and maintenance support across various campus facilities.

In addition to the regular workforce, the Institute engages approximately 818 agency manpower personnel, who support a wide range of operational activities, including maintenance, housekeeping, and other essential services, significantly contributing to the efficient functioning of the campus.

2. Governance Structure

IIT Roorkee functions within a structured governance framework established under the Institutes of Technology Act, 1961, enacted by the Indian Parliament and operates as part of the larger IIT system in India under the Ministry of Education. The governance structure ensures effective oversight, academic integrity, administrative efficiency, and accountability in the functioning of the Institute

2.1. Apex Governance: Visitor and IIT Council

At the highest level, the governance of IIT Roorkee is vested in the Visitor, i.e., the President of India, who exercises overarching supervisory powers across all IITs. The Visitor has the authority to review the functioning of the Institute and appoint key officials, including the Director. The IIT Council serves as the apex coordinating body for all IITs and is responsible for policy direction, coordination, and the review of academic and administrative standards. It ensures uniformity in governance and facilitates alignment with national priorities in higher education, research, and innovation.

2.2. Board of Governors (BoG)

At the Institute level, the Board of Governors (BoG) is the highest decision-making authority. It is responsible for the general superintendence, direction, and control of the Institute's affairs. The Board comprises representatives from the Government of India, academia, industry, and distinguished individuals, and includes the Director of the Institute. It is chaired by a chairperson appointed by the Government of India. The BoG is entrusted with:

- Formulation of institutional policies
- Approval of budgets and financial plans
- Oversight of infrastructure development and resource allocation
- Strategic decision-making and long-term planning
- Appointment of senior officials, as per statutory provisions

The Board ensures that the Institute functions in alignment with its mandate as an institution of national importance.

2.3. Director

The Director is the chief executive and academic officer of the Institute and plays a central role in its governance. The Director is responsible for implementing the decisions of the Board of Governors and ensuring the smooth functioning of all academic and administrative activities.
Key responsibilities of the Director include providing academic and administrative leadership, ensuring implementation of institutional policies, and supervising academic programs, research activities, and infrastructure development.
Representing the Institute at national and international forums, the Director acts as the primary link between the Board of Governors and the operational structure of the Institute.

2.4. Senate (Academic Governance)

The Senate is the principal academic body of IIT Roorkee and is responsible for maintaining the academic standards and integrity of the Institute.

The Senate comprises faculty members and key academic administrators and is entrusted with:

- Approval and revision of academic curricula
- Regulation of examinations and evaluation processes
- Formulation of academic policies and ordinances
- Oversight of teaching, research, and academic performance
- Award of degrees and academic distinctions

Through the Senate, IIT Roorkee ensures that its academic programs remain rigorous, relevant, and aligned with global standards.

2.5. Administrative and Functional Structure

The Director is supported by a structured administrative framework consisting of Deans, Associate Deans, Heads of Departments, and other academic and administrative functionaries. Each of these roles is responsible for specific domains such as Academic affairs, Research and development, Infrastructure and campus development, Student welfare and hostel management, international relations and collaborations, planning and resource management.
The Registrar serves as the chief administrative officer and is responsible for the day-to-day administration of the Institute, including personnel management, records, finance coordination, and regulatory compliance.

2.6. Academic Departments, Centres, and Units

The academic and operational activities of IIT Roorkee are carried out through a network of Academic Departments, Academic Centres, Centres of Excellence, Service Units and Supporting Units. These entities function under the overall governance framework and contribute to teaching, research, innovation, and institutional support services.

2.7. Committees and Decentralised Governance

To ensure efficient functioning and participatory decision-making, IIT Roorkee operates through various committees and advisory bodies constituted at different levels. These committees address specific areas such as academic matters, infrastructure and campus planning, finance and procurement, student affairs, and sustainability and environmental initiatives.
In this context, the Green Office plays an important role in guiding and monitoring sustainability-related initiatives. It works in coordination with academic and administrative units and operates under institutional leadership to ensure the effective implementation of the institute's green agenda. This structured governance system enables IIT Roorkee to effectively manage its academic, administrative, and infrastructural responsibilities while aligning with national policies and global standards.

3. Environmental Performance

3.1. Energy

3.1.1. Energy Management

IIT Roorkee is a large and evolving academic institution that has witnessed a steady increase in energy demand across its campuses. The rise in demand is driven by the expansion of academic infrastructure, research activities, residential facilities, and student population. Electricity constitutes the primary source of energy consumption, supporting administrative tasks and residential life. The institute continuously monitors its energy usage to understand consumption patterns better and identify opportunities for improved efficiency. Figure 6 shows the increase in electricity since 2023.

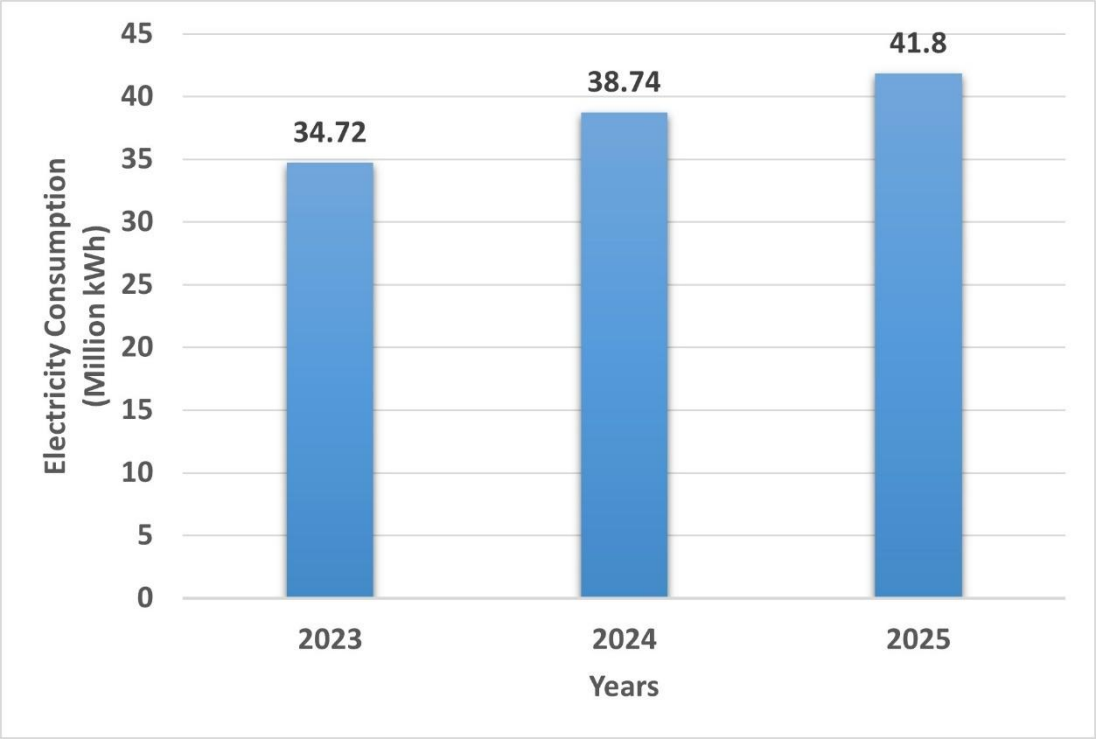


Figure 6: IIT Roorkee Electricity Consumption

While the institute predominantly relies on grid electricity provided by Uttarakhand Power Corporation Limited (UPCL), the designated state distribution utility for Uttarakhand. The institute has made consistent efforts to transition towards a more sustainable energy mix by integrating renewable energy sources. In this direction, IIT Roorkee has undertaken significant initiatives in solar energy deployment. The institute completed the installation of rooftop solar photovoltaic (SPV) systems in 2014 across 27 academic buildings on the main campus. The total installed solar capacity currently stands at approximately 2.81 MWp, comprising 1.81 MWp (DC) installed under the CAPEX model in 2014 and an additional 1 MWp (AC) commissioned under the RESCO model in 2021. The models have enabled the institute to expand its renewable energy capacity while ensuring financial and operational efficiency. The solar installations generate clean electricity on-site, contributing directly to the institute's

energy demand and reducing dependence on conventional grid power. Table 3.1 shows the SPV system installed capacity of IIT Roorkee.

Table 3.1 IIT Roorkee SPV System Installed Capacity			
	Roorkee Campus	Saharanpur Campus	Greater Noida Campus
SPV Capacity (kWp)	2810	30	47

3.1.2. Energy Efficiency Measures

The institute has implemented several energy efficiency measures to optimise electricity consumption. It has observed a notable increase in the adoption of energy-efficient appliances as a proportion of total equipment. Initiatives such as the replacement of conventional lighting systems with energy-efficient LED lighting and improvements in electrical infrastructure have contributed to reducing energy consumption while maintaining operational effectiveness. Figure 7 shows the shares of energy-efficient appliances in the institute.

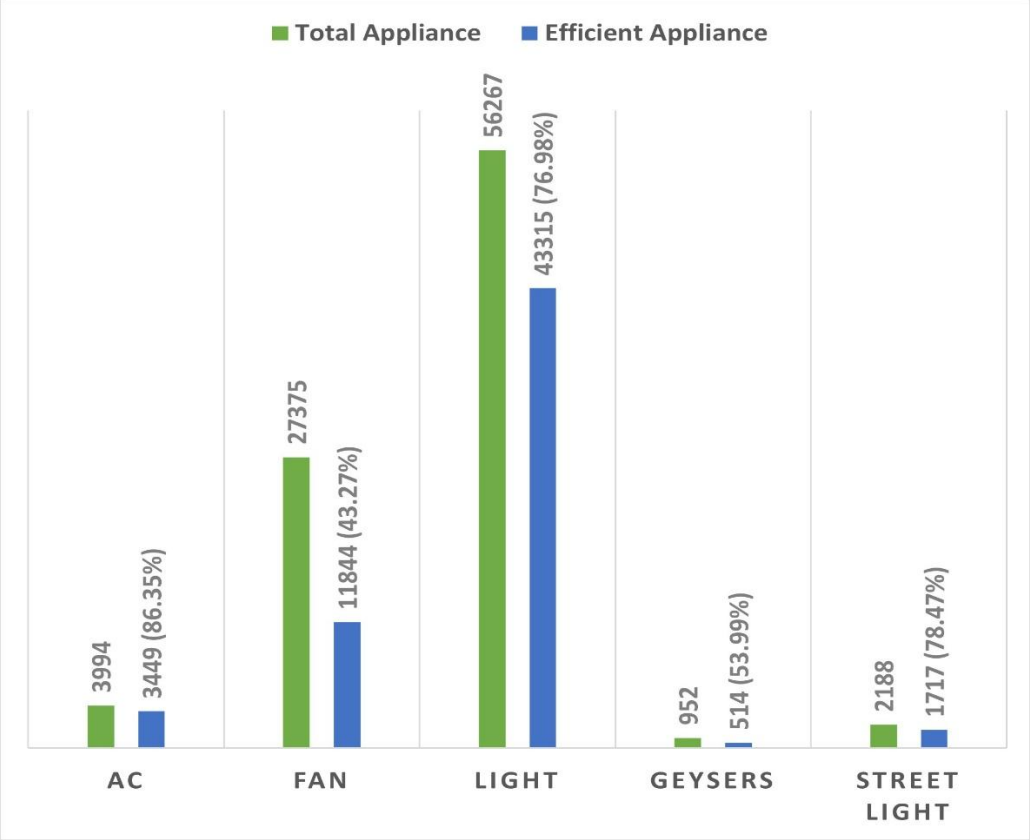


Figure 7: Energy Efficient Appliances

Aligning with the United Nations Sustainable Development Goals, particularly SDG 11 (Sustainable Cities and Communities), the institute is integrating an advanced SCADA-enabled smart campus framework to strengthen its energy management practices. This framework comprises a comprehensive energy management system supported by a microgrid and battery energy storage. In addition, the institute is establishing an Integrated Monitoring, Analytics and

Control Centre (I-MAC) to enable centralised oversight and data-driven management of key campus systems, including energy, water, transport, and waste.

3.1.3. Solarisation of Campus

IIT Roorkee has undertaken a structured solarisation initiative to reduce dependence on conventional energy sources and promote the adoption of clean and renewable energy across the campus. As part of this effort, solar photovoltaic (PV) systems have been deployed to generate on-site electricity, thereby reducing reliance on grid power and associated greenhouse gas emissions. In addition, solar water heating systems with a cumulative capacity of 4.99 lakh litres per day have been installed across its campuses, significantly reducing electricity consumption for hot water requirements. The institute has also implemented solar cooking technologies in campus kitchens and mess facilities, with a total collector area of 976 m² comprising 61 collectors, resulting in annual savings of approximately 5,000 LPG cylinders (14.2 kg each). Figure 8 shows the solarisation initiative of the institute. The deployment of these systems reflects a shift towards incorporating decentralised, resource-efficient energy solutions into the campus infrastructure. Table 3.2 shows a reduction in carbon emissions through the solarisation of the campus.

Table 3.2 IIT Roorkee Energy Consumption Data 2025

Total Electricity Consumption	4,18,43,554 kWh
Solar PV Generation	30,41,581 kWh
CO_2 Reduction via Solar PV System *(Assuming 1 kWh coal-based generation emits 0.97 kg CO_2)*	2,950 tons/year
CO_2 Reduction via Solar Steam Cooking	234 tons/year
CO_2 Reduction via Solar Water Heating System	5,762 tons/year



Figure 8: Solarisation of Campus

3.1.4. Green Building

The institute incorporates green building principles and smart infrastructure concepts across its campus to enhance resource efficiency and environmental performance. Key design elements include natural ventilation and daylighting, the integration of courtyards, optimised facade design with louvres and smaller openings on the south facade and larger glazed windows on the north façade, rooftop solar installations, and the use of energy and water-efficient appliances along with sustainable construction materials. These features have been implemented in facilities such as the Mehta Family School of Data Science and Artificial Intelligence and are increasingly being adopted across campus infrastructure.

In alignment with established green building standards, one of the buildings is currently under construction and is in the process of obtaining a Platinum rating under the Indian Green Building Council (IGBC) Green Building Certification. Additionally, the Chemistry Building and a 572-seater student hostel are under review for 'GHAR' rating as part of the Central Public Works Department Green Certification framework. The institute is progressively ensuring that all new constructions adhere to both smart building and green building principles, supporting long-term sustainability and efficient campus development.



Figure 9: Green Buildings

3.2. Water

3.2.1. Water Consumption

IIT Roorkee is also actively promoting the adoption of water-efficient fixtures to reduce overall water consumption. Currently, 47.10% of water closets, 17.60% of wash basins, and 29.35% of urinals have been replaced with water-efficient alternatives, resulting in an average adoption rate of 31.66% across campus facilities. Figure 10 shows the shares of efficient water appliances installed in the institute. The total annual water consumption for the year 2024-25 across IIT Roorkee campuses stands at approximately 2303 million litres per year, with the Roorkee campus accounting for the majority share. Figure 11 shows the water consumption share of all the campuses of IIT Roorkee. To further enhance water management, metering systems have been installed to monitor the utilisation. The institute uses its recycled water for landscape irrigation, toilet flushing, and cooling systems. The Institute's current water demand is approximately 6 million litres per day (MLD), with ongoing efforts focused on optimising water use and improving overall resource efficiency.

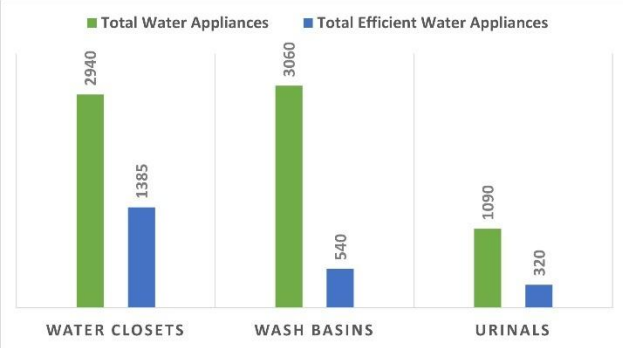


Figure 10: Water-Efficient Appliances

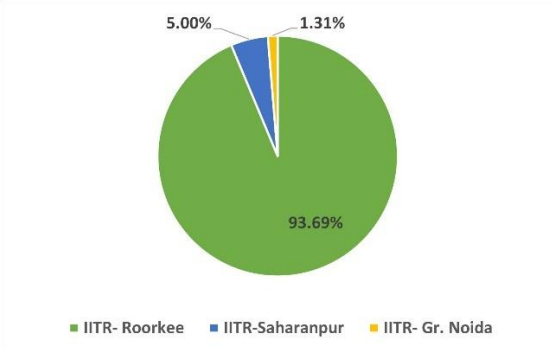


Figure 11: IIT Roorkee Water Consumption Campus-wise

3.2.2. Rainwater Harvesting

The institute is committed to reducing groundwater dependence, strengthening water conservation practices, and protecting natural habitats across its campuses. Provided with a relatively high-water table in Roorkee, the institute prioritises natural groundwater recharge through open, unpaved areas. Approximately 337,696 m² of open space is utilised to facilitate rainwater percolation, thereby enhancing groundwater replenishment. In addition, pilot-scale rainwater harvesting initiatives have been implemented, including systems installed at Kasturba Bhawan and the Department of Water Resources Development and Management, where rooftop rainwater is collected and directed for recharge. Figure 12 shows the pilot-scale rainwater harvesting project installed at the Kasturba Bhawan.



Figure 12: Rainwater Harvesting

3.2.3. Waste Water Treatment

The Indian Institute of Technology Roorkee has established sewage treatment infrastructure to ensure effective wastewater management across its campuses. In Figure 14, a fully operational sewage treatment plant (STP) with a capacity of 3 MLD is installed at the Roorkee campus, while an additional 0.5 MLD STP operates at the Saharanpur campus. These STPs are based on the Sequencing Batch Reactor (SBR) process, which employs a fill-and-draw cyclic operation incorporating aeration and non-aeration phases to achieve biological treatment and sedimentation within a single basin. The system operates with relatively low space and energy requirements and produces high-quality treated effluent suitable for safe discharge. Approximately 80% of the wastewater generated is treated through these facilities, with treated

water being reused primarily for landscape irrigation, thereby supporting resource efficiency and enabling downcycling within campus operations. During the reporting year (2024–25), approximately 670 million litres of treated wastewater were reused at the Roorkee campus, while the Saharanpur campus reported reuse of 30 kilolitres. Figure 13 shows the volume of wastewater reuse over the years.

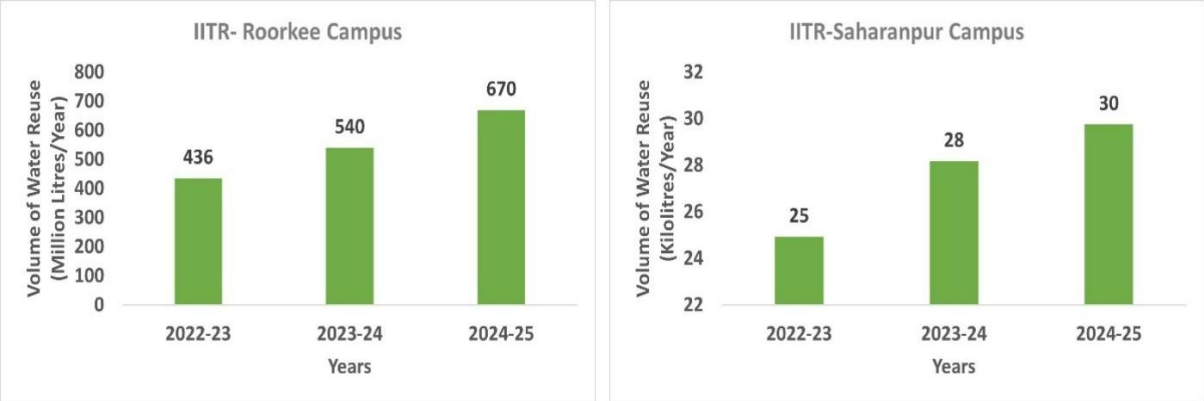


Figure 13: Volume of Reuse Wastewater



STP Roorkee (3 MLD) STP Saharanpur (0.5 MLD)

Figure 14: IITR Solid Waste Management

3.3. Waste

3.3.1. Solid Waste Management

IIT Roorkee has established a centralised solid waste management system to ensure efficient handling and processing of waste generated across the campus. The facility is developed by Fabetto Ecotech Pvt Ltd at a site provided by the cantonment board. Roorkee (figure 15). The plant processes multiple waste streams, including horticultural, departmental, and mess waste. The system is designed to manage both wet (organic) and dry (inorganic) waste, with a focus on minimising landfill disposal, promoting recycling, and supporting environmentally sustainable campus operations. To strengthen this, a door-to-door waste collection system has been introduced, along with the provision of separate bins for wet and dry waste across the campus, thereby enabling effective source-level segregation and improving processing efficiency

In parallel, the institute has undertaken measures to reduce waste generation at the source level through a formal policy aimed at minimising the use of paper and plastic, and a strong emphasis has been given to digitalisation. Administrative processes, academic communications, project submissions, and record management have been transitioned to online platforms, including digital repositories and online notification systems. Thereby reducing material consumption.
Organic waste is primarily treated at the source through composting, wherein horticultural and food waste are processed using aerobic techniques. This integrated approach, combining source-level segregation, decentralised organic waste treatment, and centralised processing, supports efficient resource recovery and reflects the institute's commitment to sustainable and resource-efficient waste management.



Figure 15: IITR Solid Waste Management

3.3.2. Waste Segregation and Processing

The institute follows a structured approach to waste segregation and treatment. Dry (non-biodegradable) waste is processed at a Material Recovery Facility (MRF), where it undergoes primary and secondary segregation. Initial sorting separates materials such as plastic, metal, and glass, followed by further classification into specific categories, including aluminium, iron, single-use plastics, multilayered plastics, HDPE, PP, LDPE, rubber, and other recyclable materials. These materials are stored separately to facilitate recycling and resource recovery.
Wet (biodegradable) waste is treated through aerobic composting. Horticultural waste is shredded and used as a soil enhancer. This process supports its reuse in landscaping activities, contributing to circular resource management.
Sanitary waste is managed through a dedicated collection system, with yellow bins (figure 16) installed at designated locations in hostels such as Sarojini Bhawan, Vigyan Kunj, Kasturba Bhawan, and Himalaya Bhawan. The collected waste is disposed of through authorised biomedical waste management agencies in compliance with regulatory requirements.



Figure 16: Sanitary Bin

3.4. Transportation

3.4.1. Sustainable Transportation

The institute promotes sustainable mobility through policies aimed at reducing the use of private motorised vehicles and encouraging environmentally friendly modes of transport. The campus planning framework prioritises walkability and cycling, with restrictions on student use of motorised vehicles and the provision of pedestrian-friendly pathways. These measures contribute to a healthier campus environment while reducing overall carbon emissions.

3.4.2. Campus Mobility and Vehicle Profile

The institute maintains a limited fleet of vehicles to support essential operations, comprising a mix of conventional and electric vehicles. Figure 17 of the institute's transport department shows the current fleet of vehicles that includes 2 electric cars, 4 diesel cars, 4 electric buggies, 3 diesel travellers, and 3 diesel buses, totalling 16 vehicles. Despite these efforts, daily vehicular inflow remains significant, with approximately 1,790 four-wheelers and 9,350 two-wheelers entering the campus. To mitigate this impact, the institute continues to promote alternative modes of transport and reduce dependence on fossil fuel-based mobility.



Figure 17: IITR-owned vehicle

3.4.3. Shuttle Services and Low-Emission Mobility

Shuttle services are available within the campus, including solar-charged, battery-operated rickshaws, which provide an efficient and low-emission transport option. While these services are not free, they are subsidised to encourage usage. These vehicles are deployed across campus to facilitate internal mobility and reflect the institute's gradual transition towards cleaner transport solutions. Figure 18 shows the low-emission mobility service available on campus.



Figure 18: IITR Low-emission mobility

3.4.4. Infrastructure for Sustainable Mobility

The campus is designed to support non-motorised transport, with extensive pedestrian pathways and cycling-friendly infrastructure (refer to figure 19). Many areas within the campus are vehicle-free, and pedestrian routes are equipped with safety features such as street lighting, designated walkways, and separators between vehicular and pedestrian traffic. Accessibility is further enhanced through ramps and guiding blocks for individuals with disabilities. The compact campus layout, with academic, residential, and administrative zones located within proximity to minimise the need for vehicular transport. As a result, parking infrastructure is limited, with only 1.4% of the total campus area allocated for parking.



Figure 19: Pedestrian Routes

3.4.5. Policy Initiatives and Awareness Measures

The institute has implemented several policy measures to discourage the use of private vehicles. A notable initiative is the observance of a “No Carbon Emitting Vehicle Day” on the first day of every month (8:00 AM to 6:00 PM), during which the use of fossil fuel-based vehicles is restricted, with exemptions for essential and emergency services. Additionally, the institute actively promotes walking and cycling through awareness and infrastructure support, reinforcing a culture of sustainable mobility. The result of the initiative is shown in Figure 20.

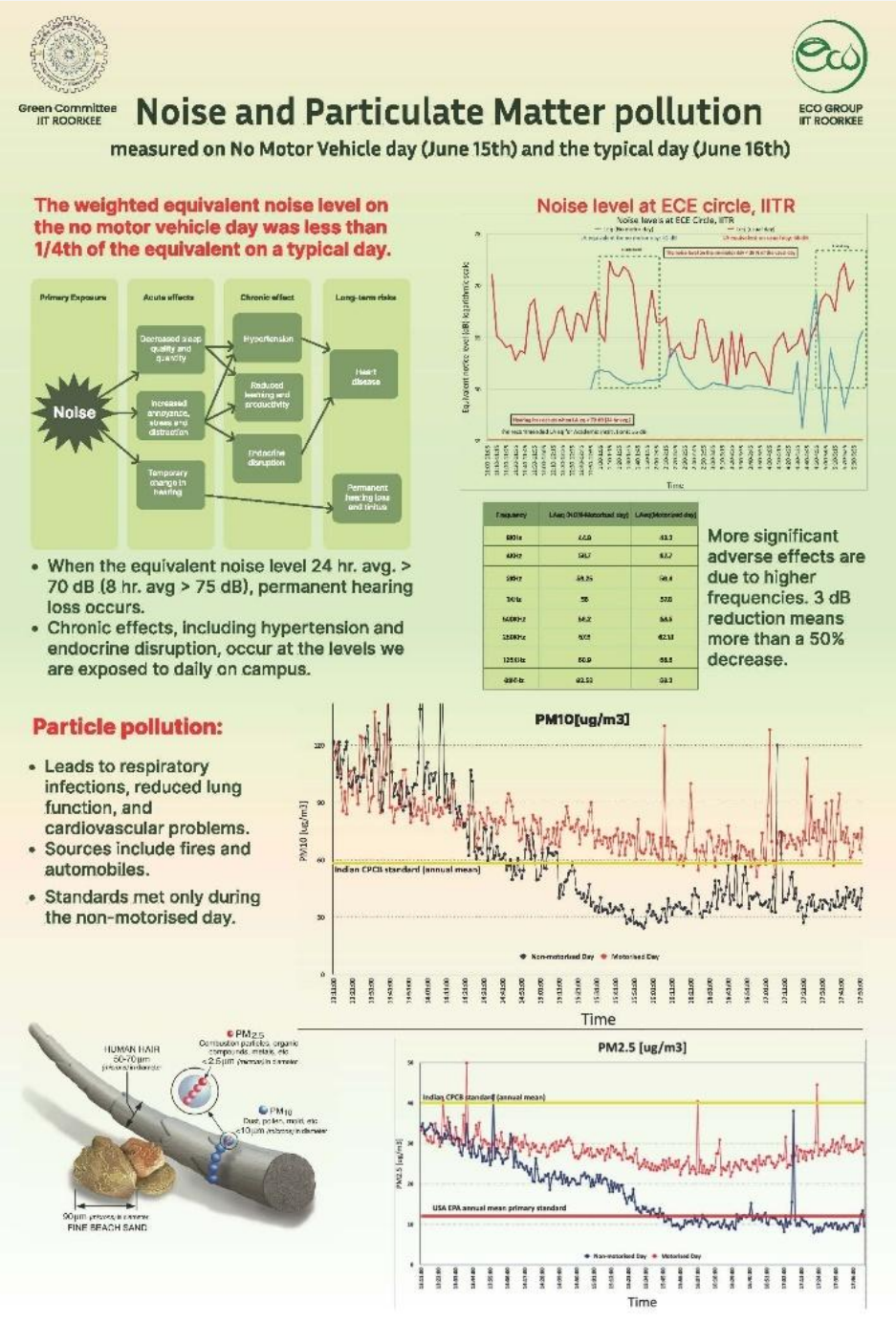


Figure 20: Result: Carbon-emitting vehicle-free day

3.4.6. Electric Mobility and Charging Infrastructure

To support the transition towards electric mobility, the institute has established charging infrastructure for electric vehicles across residential areas, including Canal View Apartments, Shivalik Apartments, Hill View Apartments, and River View Apartments, with plans for further expansion. Figure 21 shows that the dedicated charging stations are also available within the institute's vehicle section to support electric cars and buggies. These initiatives demonstrate IIT Roorkee's commitment to reducing transportation-related emissions and advancing sustainable campus mobility.



Figure 21: EV-Charging Station

4. Greenhouse Gas Emissions

IIT Roorkee quantifies its greenhouse gas (GHG) emissions to assess the environmental impact of campus operations and identify key areas for mitigation. Emissions are categorised in accordance with the Scope 1, Scope 2, and Scope 3 framework, covering direct emissions from institute-owned sources, indirect emissions from electricity consumption, and other indirect emissions associated with campus activities. During the reporting period, the institute recorded total GHG emissions of 109,819.37 tonnes CO_2 eq per year, with a per capita emission of 6.08 tonnes CO_2 eq per capita per year, compared to India's per capita emission of approximately 2.94 tonnes CO_2 eq per capita per year (2024).

Scope 1 Emissions

Scope 1 emissions comprise direct GHG emissions from sources owned or controlled by the institute, including refrigerant leakage from air-conditioning systems, fuel consumption in institute-owned vehicles, and LPG usage across residential and dining facilities. These emissions represent the institute's direct operational carbon footprint.

Scope 2 Emissions

Scope 2 emissions include indirect emissions associated with electricity consumption from grid supply and on-site solar energy generation. Grid electricity contributes the majority share of emissions under this category, while solar photovoltaic (PV) systems provide a lower-emission alternative and account for a portion of the total energy consumption.

Scope 3 Emissions

Scope 3 emissions arise from activities not directly owned or controlled by the institute but associated with its operations. These include emissions from waste management, wastewater treatment, transportation (vehicles entering the campus), food consumption, business travel, construction materials, transmission and distribution losses, and purchased goods and services.

Figure 22 illustrates the distribution of emissions across Scope 1, Scope 2, and Scope 3, while Figure 23 compares emissions across the last two reporting years, highlighting variations across different mission categories.

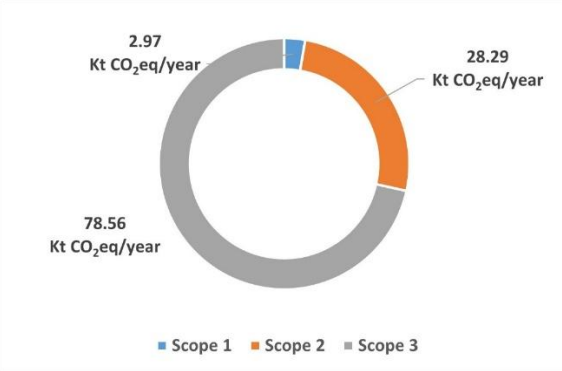


Figure 22: IIT Roorkee Scope of Emissions

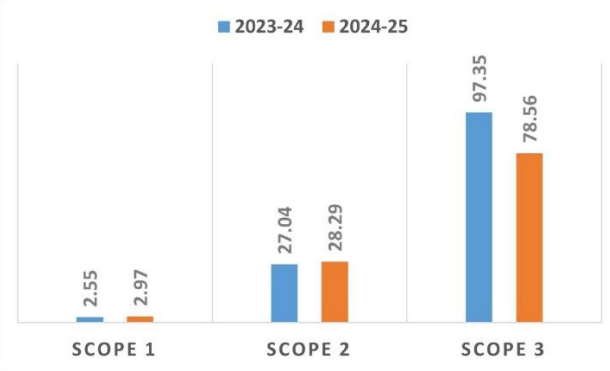


Figure 23: Scope of emission for the last two years

5. Research & Innovation

The Institute has established a strong foundation in sustainability-oriented research and innovation, driven by interdisciplinary collaboration and supported by partnerships with government agencies, industry, and private sector organisations. The Institute actively undertakes a wide range of research projects addressing critical challenges in areas such as energy transition, water resource management, waste management, and climate change mitigation.

A significant portfolio of sustainability-related projects is currently being carried out at IIT Roorkee, supported by funding from government bodies, industrial partners, and private stakeholders. These projects focus on developing practical and scalable solutions, including renewable energy systems, green hydrogen technologies, sustainable infrastructure, and circular economy approaches. The Institute's research ecosystem emphasises both fundamental research and applied innovation, ensuring that outcomes contribute meaningfully to real-world sustainability challenges.

In parallel, the institute integrates sustainability into its academic framework through the offering of several courses related to environmental sustainability, climate change, energy systems, and resource management across undergraduate, postgraduate, and doctoral programs. This integration ensures that students are equipped with the knowledge and skills required to address emerging environmental challenges and contribute to sustainable development. The Institute also promotes a culture of innovation through advanced laboratories, research centres, and collaborative platforms that facilitate the development of new technologies and solutions. These efforts are aligned with national priorities and global sustainability goals, reinforcing IIT Roorkee's commitment to advancing research, education, and innovation in support of a sustainable future.

5.1. Sustainability-related Research Projects

The institute is actively engaged in multiple sponsored research projects across diverse sustainability domains, with most of them currently in the ongoing stage. These projects demonstrate strong collaboration with leading agencies such as MNRE, DST, DBT, ISRO, NTPC, DRDO, Ministry of Earth Sciences, and international organisations, highlighting the Institute's role as a key contributor to sustainability research and innovation in India. The table below provides the complete details of the research project related to sustainability

Table 5.1 Government Funded Ongoing Projects

S.NO.	Name of the project	Name of PI	Organization Name
1	Scaling up the floating solar photovoltaic system	Prof. Arun Kumar	International Sustainable Energy Foundation (ISEF)

2	Developing a Comprehensive climate adaptation strategy and a detailed implementation road map on disaster management and infrastructure residence for India (Adapt DMIR)	Prof. Anil Kumar Gupta	MOEFCCE, UNDP, New Delhi
3	Catalytic transformations at the interface of chemistry and energy: utilisation of hydrogen gas to convert waste gases into valuable energy carriers and products	Prof. Akash Kaithal	ANRF, New Delhi
4	Prototype development of a point absorber wave energy converter for field testing	Prof. Sumana Ghosh	DST, New Delhi
5	Trash is cash, turning unmerch on table crop and forest residues into high-value carbon-negative fertilisers for regenerative farming in rural communities	Prof. Sonal Keshawrao Thengane	DBT, New Delhi
6	Carbon Budget and Eco-hydrological Dynamics of Selected Himalayan High-Altitude Grasslands and Their Carrying Capacity	Prof. Sumit Sen	GBP-NIHE Ladakh Regional Centre, Leh
7	Advancing Regional Climate Resilience: AI Monitoring of Lentic Water Bodies for Greenhouse Gas Mitigation	Prof. Basant Yadav	ANRF, New Delhi
8	Eco-innovation utilising Uttarakhand temples' floral waste: Development of sustainable water-based ink for a greener	Prof. Kirtiraj Kundlik Gaikwad	Uttarakhand State Council for science and technology, Dehradun
9	From catalyst Discovery to Process Intensification for sustainable aviation fuel from Biomass derived Bio-Oil and CO2: A synergistic Experimental and data driven innovations ‘	Prof. Komal Tripathi	ANRF, New Delhi
10	Characterising the role of groundwater in buffering the food-energy-water nexus against interannual climatic shocks	Prof. Hemant Kumar	ANRF, New Delhi

	through hydro-economic modelling		
11	Harnessing hydrokinetic energy: enhancing Darrieus turbine performance with advanced techniques (artificial neural network, numerical and experimental)	Prof. C.S. Pant	ANRF, New Delhi
12	Targeting antibiotics in the Ganga River basin: monitoring geochemical fate, and nano-enabled degradation using eco-friendly redux active composites	Prof. Nitin Khandelwal	ANRF, New Delhi
13	Novel Hybrid gas hydrate membrane-based desalination coupled with carbon capture	Prof. Hari Prakash	Ministry of Earth Sciences, New Delhi
14	Strategic evaluation & enhancement of super cavitation in SUV (Super cavitating underwater vehicles)	Prof. Hemant J. Sagar	ANRF, New Delhi
15	Network for sustainable crop production under climate change: designing and testing regional climate adaptation measures through enhanced ecohydrological modelling	Prof. K.S. Kasiviswanathan	SPARC
16	Sustainable processing of HCP alloy employing electric current-assisted (ECA) phenomena	Prof. Anuj Bisht	ANRF, New Delhi
17	Holobiome response and to past climate variability: clues from lakes of the Himalaya and its foreland	Prof. Pradeep Srivastava	Ministry of Earth Sciences, New Delhi
18	Development of sustainable and indigenous porcine collagen extraction technology for corneal and bone regeneration in battlefield injuries	Prof. Poonam Choudhary	DRDO, New Delhi, DIA-COE, IIT KANPUR

19	Integration of managed aquifer recharge and water-food nexus in higher education	Prof. Hemant Kumar	SPARC
20	The Smart Energy Metering and Billing system (SEMB): Enhancing EV Changing Infrastructure for Efficiency and Accessibility	Prof. Apurv Kumar Yadav	IIT Bhilai Innovation and Technology Foundation, Chhattisgarh
21	Probing the interfacial water structure at covalent organic interfaces using vibrational sum frequency generation	Prof. Ravindra Pandey	DST, New Delhi
22	Investigation of the Wide-area Simulation framework for renewable energy and HDFC systems to accurately capture their dynamic behaviour	Prof. Himanshu Jain (Project Coordinator)	1. Grid Controller of India Ltd., Mumbai, 2. IIT Bombay
23	Development of a satellite imagery-informed decision support system for climate-resilient drinking water treatment (SiDCReW)	Prof. Bihu Suchetana	ISRO, Bangalore
24	Integrating remote sensing and experimental studies to assess wildlife impacts on soil and water quality	Prof. Nitin Khandelwal	ISRO, Bangalore
25	Development of Specifications for the use of waste plastic in asphalt mixtures: a major step towards building sustainable road infrastructure	Prof. Nikhil Saboo	National Highway Authority of India (NHAI), New Delhi
26	Design and Development of Power Backup of 1-5 Wh based on a sodium ion cell operable at sub-zero temperatures for renewables	Prof. Yogesh Kumar Sharma	MNRE
27	Short carbon fibre reinforced high entropy high temperature Ceramic Composites	Prof. Ankit Bansal	DRDO, Delhi

28	Decentralised Rainwater Harvesting and Greywater treatment using electro coagulations ceramic membrane systems in the Indian Himalayan region	Prof. Abhijit Maiti	National Mission on Himalayan Studies (NMHS), G.B. Pant National Institute of Himalayan Environment Almora
29	Study the dynamics of the Submarine groundwater discharge (SGD) using the joint application of geophysical, geochemical and hydrodynamics modelling	Prof. Pallavi Chattopadhyay	CSIR, ASPIRE, New Delhi
30	Informal Settlement National Policies and Urban Inclusion Adaptation Strategies and Challenges Comparative Study in Kolkata, Delhi, and Mumbai	Prof. Uttam Kumar Roy	SPARC
31	Exploring Mitigation Pathways for Holistic Sustainable Development in Indian States (EMPHASIS)	Prof. Tarun Sharma	CICERO (Centre for International Climate Research (Project Owner), Research Council of Norway
32	Glaciers and Glacier Melt Runoff Changes and their Linkage to the hydro climatic and topographic *context* in the upper ganga basin (UGB) (SP-86) with special focus on six headstreams of the ganga and their associated glaciers	Prof. Ashutosh Sharma	National Mission for Clean Ganga, Ministry of Jal Shakti, GOI, New Delhi
33	Prototype development for component recycling from spent solar panels	Prof. Nikhil Dhawan	DST, New Delhi
34	Carbon electrode-based indigenous low-cost perovskite solar cells development	Prof. Soumitra Satapathi	Central Mine Planning & Design Institute Limited, Jharkhand
35	Advancing Regional Climate Resilience: AI Monitoring of Lentic Water Bodies for Greenhouse Gas Mitigation	Prof. Basant Yadav	ANRF, New Delhi

36	Eco-innovation utilising Uttarakhand temples' floral waste-Development of sustainable water-based ink for a greener	Prof. Kirtiraj Kundlik Gaikwad	Uttarakhand State Council for science and technology, Dehradun
37	Moment Tensor Inversion using 3D Greens Functions: Investigating the effect of crustal thickening in the Himalayas on earthquake mechanisms	Prof. Vipul Silwal	MOES, NEW DELHI

Table 5.2 PSUs Funded Ongoing Projects

S.no.	Name of the Project	Name of the PI	Organization name
1	Establishment of the Research and Experiential Learning Centre on sustainable energy and circularity	Prof. Andallib Tariq	NTPC, New Delhi
2	Carbon electrode-based indigenous low-cost perovskite solar cells development	Prof. Soumitra Satapathi	Central Mine Planning & Design Institute Limited, Jharkhand
3	Cyber threat detection and mitigation techniques for the power transmission network	Prof. Bhavesh Kumar Bhalja	Powergrid centre of excellence in Cyber Security IISC, Bangalore
4	Quantification and attribution of the climate-induced and human-derived variability in the past and future terrestrial water storage of the tehri reservoir catchment area	Prof. Brijesh Kumar Yadav	THDC, India Ltd., Bhagirathi Bhawan, Tehri Garhwal, Tehri

Table 5.3 Private Funded Ongoing Projects

S.no.	Name of the Project	Name of the PI	Organization name
1	SURAKSHIT SAFAR 2026 2028: Enhancing Traffic Safety through a Children-Led Awareness, Behavioural Assessment, and school-level risk mitigation, an applied social research study	Prof. Ashu Khanna	EFKON India Private Limited, Gurugram, Haryana

2	development of sustainable substrate solutions for sublimation coating and printing applications	Prof. Kirtiraj Kundlik Gaikwad	DCC Group, Mumbai
3	Development of cost-effective and low-carbon footprint sustainable paper for producing paper-based mailers as an alternative packaging material	Prof. Vibhor Kumar Rastogi	Amazon India Pvt. Ltd, Bangalore, Karnataka
3	Quality assessment of groundwater samples for identifying suitable locations to build two water purification systems of 3000 L/Day Capacity for Drinking Water	Prof. Abhijit Mahi	Imagination Environmental Solutions Pvt. Ltd., New Delhi
4	Innovative and sustainable strategies for chloride neutralisation and corrosion mitigation to enhance the durability and service life of RCE structures	Prof. Umesh Kumar Sharma	Ushta Infinity Construction Pvt. Ltd. Vadodara

Table 5.4 International Funded Ongoing Projects

Sr No.	Name of the Project	Name of the PI	Organization Name
1	Resilient food and water systems under global change: An SDG-driven approach for traditional/small rural communities	Prof. Ashish Pandey	German Academic Exchange Services (DAAD)
2	Exploring Mitigation Pathways for Holistic Sustainable Development in Indian States (EMPHASIS)	Prof. Tarun Sharma	CICERO (Centre for International Climate Research (Project Owner), Research Council of Norway

Table 5.5 Non-Profit Organisation Funded Ongoing Projects

Sr No.	Name of the Project	Name of the PI	Organization Name
1		Prof. Basant Yadav	

	Climate-resilient water services partnership with IITR		United Nations Children's Fund, New Delhi

5.2. Consultancy Projects Related to Sustainability

In addition to its research initiatives, IIT Roorkee actively engages in consultancy projects related to sustainability, providing technical expertise and advisory support to government agencies, public sector undertakings, private industries, and international organisations. These consultancy activities play a crucial role in translating academic knowledge into practical, real-world solutions to environmental and sustainability challenges

During the reporting period, a total of 199 consultancy projects related to sustainability were undertaken by the Institute. Among these, 126 projects were supported by the private sector, reflecting strong industry engagement and the growing demand for sustainable solutions in industrial and commercial operations. The institute also undertook 61 government-funded consultancy projects, contributing to policy development, infrastructure planning, environmental management, and climate resilience initiatives. In addition, 11 projects were supported by public sector undertakings, along with 1 internationally funded project, indicating emerging global engagement.

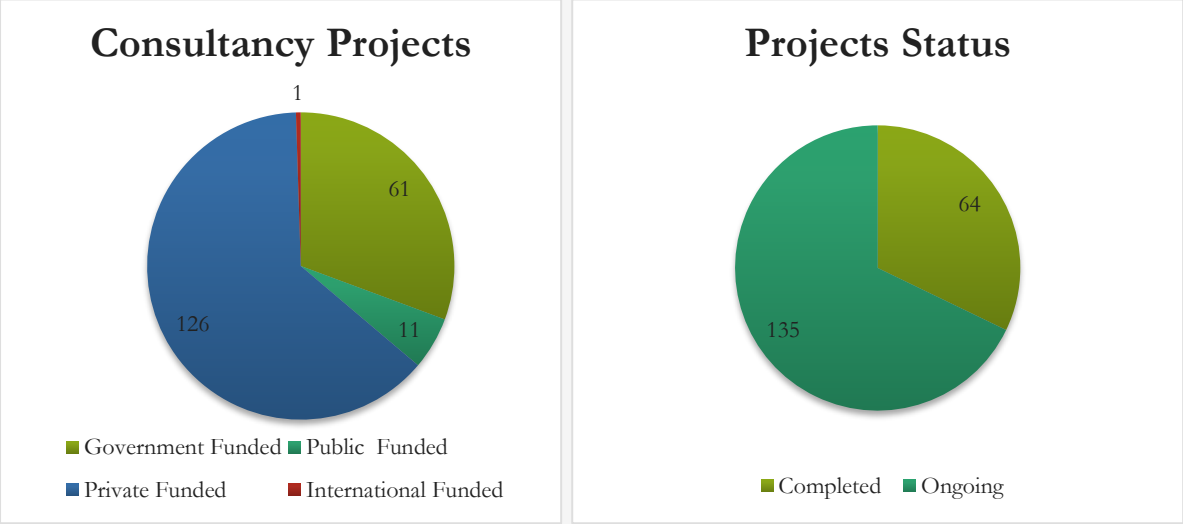


Figure 24 Consultancy projects and their status

Figure 24 presents the distribution and status of consultancy projects, indicating the number of ongoing and completed projects. The data reflects sustained institutional engagement in consultancy activities, including those aligned with sustainability-related domains, and highlights continuity in project execution over the reporting period.

5.3. Patents Granted for the Calendar Years 2021–2025

Innovation at the Indian Institute of Technology Roorkee is reflected in its portfolio of patents granted, demonstrating the Institute's focus on translating research into practical and scalable technologies. Figure 25 presents the trend in patents granted over the reporting period, indicating sustained engagement in research and innovation activities.

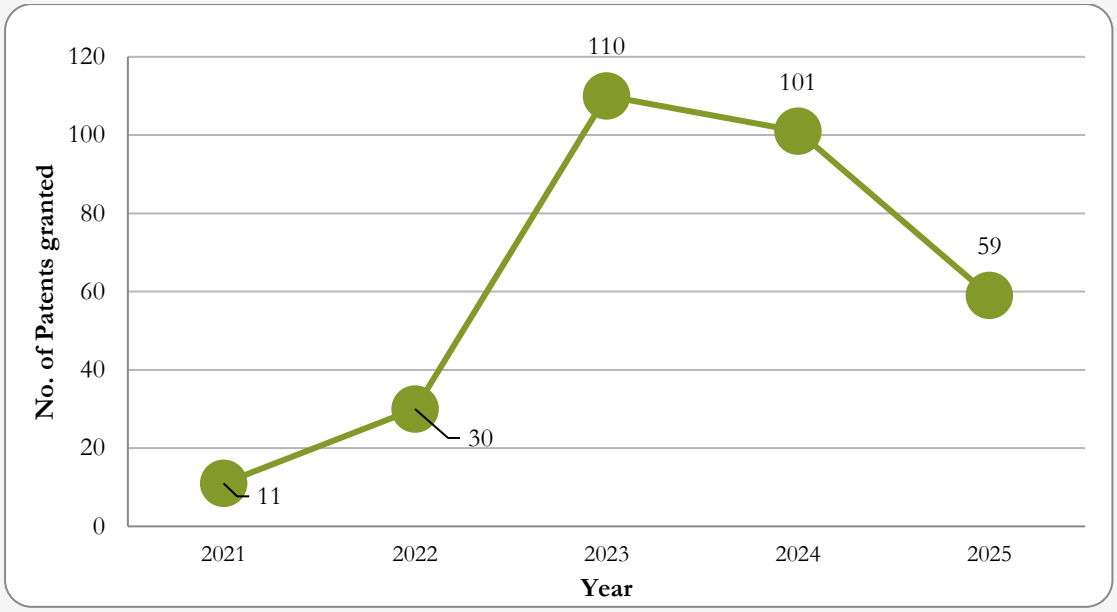


Figure 25: Number of Patents Granted Under Sustainability

A significant proportion of these innovations is aligned with sustainability-oriented domains, including renewable energy, water management, waste utilisation, advanced materials, and climate-resilient technologies. This reflects the Institute's emphasis on developing solutions that address environmental challenges and support sustainable development.

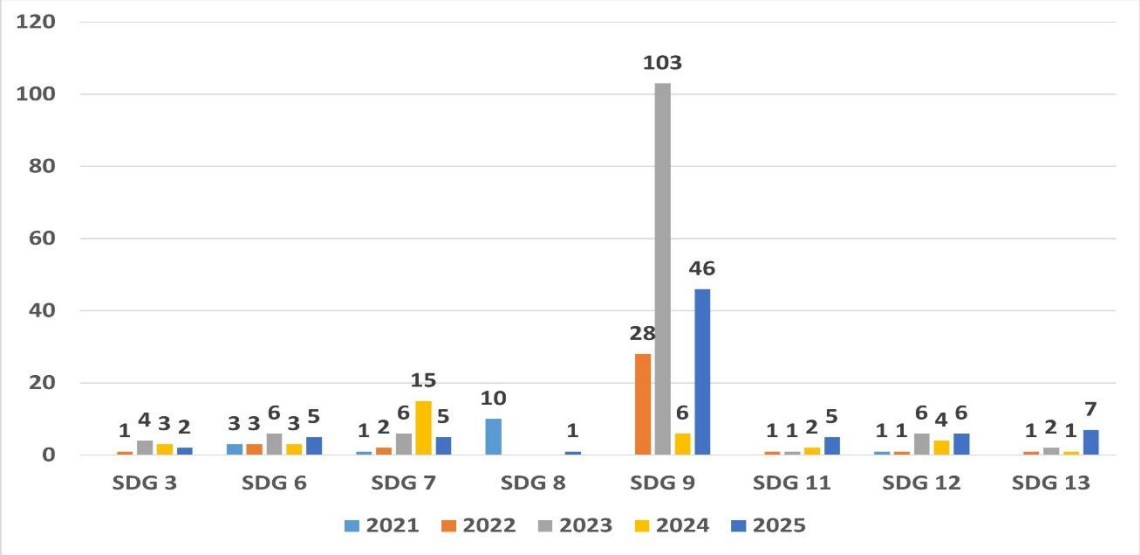


Figure 26: Patent Granted Under SDGs

The Institute's research and innovation activities are aligned with the United Nations Sustainable Development Goals (SDGs), contributing to key areas such as good health and well-being, clean water and sanitation, affordable and clean energy, industry and infrastructure, sustainable cities, responsible consumption, and climate action. Figure 26 presents the distribution of patents across SDG categories, indicating stronger engagement in areas related to technological innovation and clean energy, along with consistent contributions towards water sustainability and climate action.

5.4. Alumni Funds Contribution

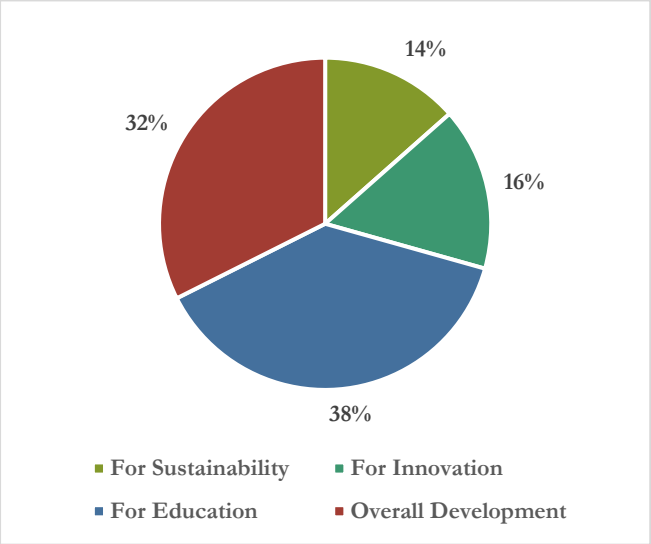


Figure 27: Alumni Funds

Alumni engagement continues to play a significant role in supporting the developmental and sustainability initiatives of the IIT Roorkee. During the reporting period, the institute received total alumni contributions amounting to ₹3.73 crore, reflecting sustained commitment from its alumni community towards institutional growth. Of this, ₹50.26 lakh (approximately 13–14%) was directed towards sustainability-related initiatives, supporting efforts in environmental conservation, resource efficiency, and green campus development. Additionally, ₹59.19 lakh (16%) was allocated to innovation-driven activities, while ₹1.43 crore (38%) supported educational initiatives, including academic infrastructure and student development. The remaining ₹1.21 crore (32%) contributed to broader institutional development needs. Figure 27 illustrates the distribution of these contributions, highlighting education and overall development as the primary areas of support, while also indicating a growing allocation towards sustainability initiatives, reflecting evolving alumni priorities and alignment with the institute's long-term development goals.

5.5. Sustainability-Focused Academic Programs

IIT Roorkee integrates sustainability into its academic framework through a combination of core undergraduate courses and specialised postgraduate programs across multiple disciplines. At the undergraduate level, a series of Environmental Science and Sustainability courses is offered to students across diverse streams, including engineering, sciences, architecture, and humanities (refer to Table 5.6). This ensures that all students are exposed to fundamental concepts of sustainability, environmental management, and resource efficiency as part of their academic curriculum.

Table 5.6 UG Courses

Courses	Departments
Environmental Science and Sustainability Course-I	Civil Engineering, Architecture, Earth Science and Hydro and Renewable Energy
Environmental Science and Sustainability Course-II	Electrical Engineering, Electronic and Communication Engineering, Computer Science and Engineering, Physics, Data Science and Mathematics

Environmental Science and Sustainability Course-III	Chemistry, Chemical, Bio Sciences and Bio Engineering, Humanities and Social Sciences
Environmental Science and Sustainability Course-IV	Mechanical & Industrial Engineering and Metallurgical & Materials Engineering

At the postgraduate level, the institute offers a wide range of specialised programs aligned with sustainability themes, spanning areas such as environmental engineering, renewable and hydro energy, water resource management, disaster mitigation, climate resilience, electric mobility, and sustainable design (refer to Table 5.7). These programs are delivered through multiple departments and centres, reflecting a strong interdisciplinary approach to sustainability education.

Table 5.7 PG Courses

Courses	Departments
M.Arch. & M.U.R.P.	Architecture and Planning
MTech. (Disaster Mitigation & Management)	Centre of Excellence in Disaster Mitigation & Management
MTech. (Environmental Engineering)	Civil Engineering
M.Des.(Industrial Design)	Design
MTech. (Seismic Vulnerability and Risk Assessment)	Earthquake Engineering
MTech. (Electric Vehicle Technology)	Electrical Engineering
MTech. (Renewable and Hydro Energy) & MTech. (Environment Management of Rivers and Lakes)	Hydro and Renewable Energy
MTech. (Surface Water Hydrology), MTech. (Ground Water Hydrology) & MTech. (Watershed Management)	Hydrology
MTech. (Dam Safety and Rehabilitation)	International Centre of Excellence for Dams
MTech. (Packaging Technology)	Paper Technology
MTech. (Irrigation Water Management), MTech. (Water Resources Development) & MTech. (Drinking Water and Sanitation)	Water Resources Development & Management

6. Student Development, Social Well- being & Sustainability Initiatives

IIT Roorkee places strong emphasis on the holistic development and well-being of its campus community, supported by a range of student-led initiatives, institutional support systems, and sustainability-focused activities. The Institute fosters an inclusive and engaging campus environment through various student development groups and societies, which promote leadership, innovation, social responsibility, and community participation.

In parallel, dedicated sustainability-oriented groups and initiatives actively engage students and staff in environmental awareness, resource conservation, and green practices across the campus. These efforts complement the Institute's broader sustainability goals and encourage active participation from the campus community.

The Institute also provides comprehensive wellness and healthcare facilities, including on-campus medical services and support systems, ensuring the physical and mental well-being of students, faculty, and staff.

6.1. Student Skill Development and Capacity Building Initiatives

In pursuit of its commitment to fostering holistic student development and industry readiness, IIT Roorkee provides a wide range of platforms and initiatives aimed at enhancing students' technical, professional, and interpersonal skills. The Career Development Cell (CDC) of the Institute serves as the primary body responsible for facilitating these efforts, acting as a bridge between students and industry.

Through its structured programs, the Career Development Cell enables students to engage with industry experts, practitioners, and thought leaders, offering valuable exposure to real-world challenges and career opportunities. These initiatives are designed to equip students with the necessary competencies to navigate diverse career pathways, while encouraging innovation, problem-solving, and leadership.

The Institute, through the Career Development Cell and associated student-led bodies, actively organizes skill development workshops, expert lectures, internships, and collaborative projects, ensuring continuous learning beyond the classroom. In addition, focused efforts are made to support students in career preparedness, including guidance for internships, placements, and professional interactions.

Skill development	Programmes
Higher Studies and research	1. Study Abroad Awareness Program focusing on higher education opportunities in Ireland and New Zealand
	2. Funding opportunities for undergraduate (UG), postgraduate (PG), &PhD students.

	3.Gateway to Study in Germany: An Exclusive Session with a DAAD Expert.
	4. FROM CAMPUS TO BARC - The Pathway to Research & Innovation
Data Centre Skills Development	Two-Day Workshop on Data Centre Skills Development in association with Aurionpro
Block Chain	Panel Discussion and Awareness Session on Block chain
Entrepreneurial and intrapreneurial thinking for Start-ups	Start-up Mind-set & Intrapreneurship Session
Internship and Placement Preparation	1. Mock Tests
	2. Mock Interviews
	3.DSA Mock AI Interviews
	4.Internship repository
	5. Placement preparation knowledge sessions (including Resume Building Session)
hands-on project experience	CDC Open Project Initiative
Off Campus Opportunities and Personal Brand Crafting	ISB: Building Your Personal Brand for Career Success
Language Course	1. Japanese
	2. French

The Career Development Cell also plays a key role in strengthening the Institute's alumni network, fostering mentorship opportunities and industry connections that contribute to students' long-term professional growth.

The effectiveness of these skill development initiatives is reflected in the feedback received from both students and employers, with all programs consistently rated as satisfactory, indicating a positive impact on student preparedness and industry relevance.

6.2. Community Engagement, Social & Sustainability Groups

The Institute fosters an active and inclusive campus environment through a range of student-led groups and institutional initiatives focused on social responsibility, community engagement, and environmental sustainability. These platforms provide students with opportunities to contribute meaningfully beyond academics while developing a strong sense of civic responsibility. Organisations such as NSS IIT Roorkee, Unnat Bharat Abhiyan, and CRY IITR actively engage students in community outreach, rural development, and social welfare initiatives, addressing issues related to education, health, and inclusive development. In parallel, groups like ECO IITR and the IGBC Student Chapter promote environmental

awareness and sustainable practices on campus, encouraging responsible resource use and green initiatives.

The Institute's sustainability efforts are further strengthened by the Green Committee, IIT Roorkee, which plays a central role in promoting and coordinating campus-wide environmental initiatives. The Committee works towards advancing sustainability practices, enhancing awareness, and supporting the implementation of green policies and action plans across the Institute. Student-driven organisations such as Enactus IITR further contribute by developing innovative, impact-oriented solutions that address social and environmental challenges through entrepreneurial approaches.

6.2.1. NSS IITR

NSS IIT Roorkee is a student-driven organisation committed to community service, social awareness, and nation-building through structured volunteer initiatives. With an active participation of around 200 students, the organisation engages the campus community in impactful programs across education, health, sustainability, and civic responsibility, fostering a strong sense of social commitment.

The organisation conducts a range of initiatives, such as clothes and e-waste collection drives, Swachhta Hi Seva campaigns, Ganga cleanliness drives, and vegan outreach sessions, addressing both environmental and social concerns. It also organises awareness and capacity-building activities, including self- defence workshops for female students and road safety campaigns. Flagship events such as the Road Safety Month and National Social Summit further strengthen outreach and engagement, reflecting NSS IIT Roorkee's continued efforts towards creating a responsible and socially conscious campus community.

6.2.2. UNNAT BHARAT ABHIYAN

Unnat Bharat Abhiyan (UBA), IIT Roorkee, is a student-led rural development and community outreach initiative working across five adopted villages, namely Meerpur, Puranpur, Gopalpur, Rithaura Grunt, and Beladi-Salhapur. The club has an active participation of 110+ students. The initiative focuses on education, health, sanitation, women's empowerment, livelihood generation, skill development, digital awareness, and sustainable rural development.

Over the past year, UBA IIT Roorkee has implemented 20+ village-level initiatives, including school awareness drives, science and AI workshops, health camps, Ayushman card registrations, cycle donation drives, sanitary napkin machine installations, and skill development programs for self-help groups. Additional efforts include sustainable agriculture practices, soak pit construction, and eco-friendly livelihood interventions, promoting long-term community resilience. The initiative has made a significant impact, reaching hundreds of villagers and students through targeted programs. Key outcomes include active student engagement in science and AI awareness, support for girls' mobility through cycle donations, facilitation of government schemes, and training of women in income-generating activities such as resin art and sustainable product development. UBA IIT Roorkee places strong emphasis on sustainability through initiatives such as decentralised sanitation systems, organic product development, eco-friendly alternatives, and community-based livelihood generation, contributing to environmentally responsible and socially inclusive rural development.

6.2.3. ENACTUS IITR

Enactus IIT Roorkee is a student-led organisation dedicated to driving social and environmental impact through entrepreneurial action. With a team of around 40 students, the organisation develops sustainable, business-oriented solutions to address real-world challenges, combining innovation with practical implementation.

The team works on multiple impactful projects such as Project Stub Xtract, which converts agricultural residue into value-added bioproducts to address stubble burning, and Project Ark, which upcycles temple floral waste into eco-friendly products while generating livelihoods for local communities. Other initiatives include the Black Soldier Fly project for organic waste management, the Seabin project targeting water pollution, and the development of solar dryers to reduce post-harvest losses, reflecting a strong focus on circular economy and sustainability.

Enactus IIT Roorkee also actively promotes innovation through events such as Envision, a national-level project showcase, and Enact-a-thon, an ideation challenge encouraging students to develop scalable solutions to societal problems. These initiatives witness wide participation and foster a culture of entrepreneurship and sustainability on campus.

The organisation's efforts have been recognised at national platforms, with projects achieving positions in competitions such as the Hult Prize, Enactus Nationals, and other business and case competitions, highlighting the impact and scalability of its initiatives.

6.2.4. CRY IITR

CRY IIT Roorkee is a student-driven initiative dedicated to the welfare and holistic development of underprivileged children, with an active team of over 100 members working across campus and nearby communities. The organisation focuses on education, health, awareness, and child rights, aiming to create long-term, sustainable impact.

A key pillar of its work is the 365 Days Mentorship Program, conducted regularly in nearby villages such as Majra, where volunteers provide foundational education in core subjects along with holistic development support. The program has been strengthened through structured teaching methods, student grouping, regular assessments, and a defined curriculum, ensuring measurable academic progress. The organisation also plays a significant role in improving access to formal education through the RTE (Right to Education) initiative, successfully facilitating school admissions for multiple children by assisting families with awareness, documentation, and application processes. CRY IIT Roorkee conducts extensive health and social awareness campaigns, covering areas such as nutrition, hygiene, digital literacy, mental health, and child safety. Community engagement is further strengthened through parent-mentor interactions and cultural activities, fostering a supportive ecosystem for sustained development.

6.2.5. Cultural Council

The Cultural Council at IIT Roorkee serves as the central platform for 18 constituent clubs, engaging over 800 students in activities that promote artistic excellence, creativity, and cultural heritage. It plays a key role in fostering a vibrant and inclusive campus environment through diverse initiatives spanning performing, visual, and literary arts.

Over the past year, the Council has successfully executed 117 initiatives, including workshops, screenings, and cultural showcases, providing students with opportunities for creative

expression and skill development. The Council has also achieved significant recognition at national platforms, with 40 major highlights, including victories in dance and DJ competitions, and multiple podium finishes at the Inter-IIT Cultural Meet and other national festivals.

6.2.6. SPIC MACAY

SPIC MACAY at IIT Roorkee is a student-led heritage group dedicated to promoting Indian classical music and cultural traditions, with participation from around 85 students. It organises curated performances and workshops to foster cultural appreciation among students.
Key initiatives include the Virasat'26 series, featuring performances by renowned artists such as Pandit Rajendra Gangani and Pandit Nityanand Haldipur, along with traditional art workshops like Gond Art sessions.

6.2.7. Liaison Officers (SC/ST/OBC) and Inclusive Initiatives

IIT Roorkee, through its Liaison Officers for SC, ST, and OBC categories, undertakes a range of initiatives aimed at promoting inclusivity, awareness, and equal opportunity within the Institute. These efforts are further supported by an active student volunteer team, which organises activities throughout the year to engage both students and staff.
During the reporting period, several awareness programs, workshops, and outreach activities were conducted. These included guest lectures by eminent speakers, workshops on reservation policies and RTI-related matters, and awareness sessions addressing issues related to social equity and inclusion. Special events such as Indian Constitution Day celebrations, Dr B.R. Ambedkar Jayanti, and related lectures and discussions were organised to promote constitutional values and social awareness.
Engagement activities such as quiz competitions, drawing competitions for staff and students' children, and educational visits, including a Parliament visit and a visit to the Dr B.R. Ambedkar National Memorial, were also conducted. In addition, initiatives like blood donation camps in collaboration with NSS further strengthened community participation and social responsibility.

6.3. International Relations and Global Engagement

IIT Roorkee maintains a strong and diverse international presence, with around 308 international students enrolled across a wide range of academic programs, including M.Arch., M.Des., M.Sc., MTech., MBA, PG Diploma, and PhD. These students are distributed across multiple departments and centres, reflecting the Institute's multidisciplinary academic ecosystem.
The Institute provides a supportive environment for international students through facilities such as accommodation, scholarships and fee waivers, cultural and sports engagement, and campus support services, ensuring a well- rounded academic experience.
In addition to hosting international students, IIT Roorkee actively engages in global academic collaborations and knowledge exchange programs with leading universities worldwide. These include partnerships with institutions such as the University of Tokyo (Japan), Technical University of Munich (Germany), National Taiwan University (Taiwan), National Tsing Hua University (Taiwan), University of Porto (Portugal), and Singapore University of Technology and Design (Singapore), among others across Europe and Asia. These exchange programs are

ongoing through various academic and collaborative channels, facilitating student mobility, joint research, and cross-cultural learning opportunities. Such initiatives significantly strengthen the Institute's international outreach and contribute to a globally connected academic environment.

6.4. Healthcare and Mental Wellness Framework

IIT Roorkee adopts a comprehensive approach towards healthcare and mental well-being, ensuring that students, faculty, and staff have access to timely medical support and wellness services. The Institute provides on-campus healthcare facilities, preventive care, and emergency services, supported by qualified medical professionals and necessary infrastructure.
To address mental health specifically, IIT Roorkee has established a dedicated Wellness Centre, which provides counselling services, psychological support, and mental health awareness initiatives. The centre plays a crucial role in helping individuals manage stress, emotional challenges, and academic pressures in a confidential and supportive environment.
Together, these initiatives form an integrated framework that prioritizes the health, safety, and holistic well-being of the campus community.

6.4.1. IIT Roorkee Hospital

The Institute Hospital at IIT Roorkee, established in 1957, provides comprehensive healthcare services to students, faculty, staff, and their dependents. The hospital operates as a 40-bed facility with round-the-clock medical support, ensuring timely and efficient healthcare delivery to the campus community.
The hospital offers a wide range of services, including Outpatient (OPD) and Inpatient (IPD) care, along with diagnostic and support facilities such as pathology laboratory, digital X-ray, physiotherapy, and dental services. Emergency medical services and 24×7 ambulance facilities are also available to address urgent healthcare needs. The medical team is led by a Chief Medical Officer, supported by full-time Medical Officers, visiting specialists, and paramedical staff, ensuring quality healthcare delivery across multiple disciplines. Preventive and community health services, including vaccination programs and regular health check-ups, are also conducted as part of the Institute's healthcare framework.
The hospital functions 24×7 throughout the year, including emergency services on holidays, ensuring uninterrupted medical care. Additionally, the Institute provides medical insurance support through a Group Health Insurance Policy, offering reimbursement benefits to faculty, staff, and their dependents.
The hospital caters to a wide range of health conditions, including general illnesses, chronic diseases, paediatric care, and dental health, along with awareness and preventive healthcare initiatives aimed at promoting overall well-being.

6.4.2. Wellness Centre

The Wellness Centre at IIT Roorkee (formerly known as the Counselling Cell) serves as a dedicated facility to support the mental and emotional well-being of students. Recognising the challenges posed by a highly competitive academic environment, the Centre provides a safe and supportive space for students to address personal, social, and academic concerns.

The Centre offers confidential, one-on-one counselling services conducted by a qualified student counsellor, creating an environment where individuals can openly discuss issues related to stress, anxiety, relationships, or academic pressures. These sessions are based on guided interaction and dialogue, with a focus on helping students better understand their concerns and make informed decisions, without the use of medication.

Operating on the principles of confidentiality, accessibility, and non-judgment, the Wellness Centre ensures that students feel comfortable seeking support, with no stigma attached to utilising its services. Counselling sessions, which may extend up to an hour, are provided free of cost, making mental health support easily accessible to all students.

7. Conclusion

The sustainability journey of IIT Roorkee reflects a structured and evolving commitment towards integrating environmental responsibility with academic excellence and institutional growth. Through a well-defined governance framework led by the Green Committee and supported by interdisciplinary participation, the Institute has established a strong foundation for implementing sustainability initiatives across its campuses.

The Institute has demonstrated measurable progress in key areas such as energy transition, water management, waste processing, and sustainable mobility, supported by the adoption of renewable energy systems, efficient resource utilisation, and infrastructure planning aligned with environmental norms. Initiatives such as solarisation, wastewater reuse, solid waste segregation, and promotion of low-emission transport highlight a systematic approach towards reducing environmental impact.

In parallel, IIT Roorkee continues to strengthen its role in sustainability-driven research, innovation, and consultancy, with significant contributions from government, industry, and international collaborations. The increasing number of sustainability-focused projects and patents reflects the Institute's growing capacity to develop practical and scalable solutions to global challenges, aligned with the United Nations Sustainable Development Goals.

The Institute's commitment extends beyond infrastructure and research to include education, student engagement, and community outreach, ensuring that sustainability is embedded within its academic curriculum and campus culture. Student-led initiatives, social engagement programs, and institutional support systems for health and well-being further reinforce a holistic approach to sustainable development.

While significant progress has been achieved, IIT Roorkee recognises that sustainability is a continuous and evolving process. The Institute remains committed to further strengthening its efforts in reducing carbon emissions, enhancing resource efficiency, and fostering innovation-driven solutions, in alignment with India's net-zero commitment by 2070.


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