



GOAL 12

RESPONSIBLE CONSUMPTION AND PRODUCTION

Swami Rama Himalayan University (SRHU) demonstrates a strong commitment to advancing Sustainable Development Goal (SDG) 12: Responsible Consumption and Production by integrating sustainability into its core values and operations. The University actively fosters eco-friendly practices on campus, including waste reduction, energy efficiency, and the utilization of sustainable resources. Through its academic programs and research initiatives, SRHU cultivates awareness and innovation, empowering students and faculty to devise solutions for sustainable production and consumption. Automated systems have been implemented to optimize the conservation of energy and water resources, while all stakeholders—students, faculty, and staff—are encouraged to use instruments, lights, fans, and air conditioning responsibly. The campus's clean and green environment, supported by extensive plantation and landscaping, helps mitigate air pollution, lower temperatures, and reduce reliance on air conditioning during summer months. Furthermore, the efficient use of advanced laboratories, solar and



biogas energy generation, and sewage treatment plants (STPs) reinforces a culture of sustainability and responsible resource management throughout the SRHU campus.

Curriculum Enrichment

Of the 1,134 courses offered across various disciplines, approximately 5% are specifically designed to align with Sustainable Development Goal (SDG) 12: Responsible Consumption and Production. These courses aim to enhance students' understanding of resource conservation and promote a culture of responsible consumption for environmental sustainability. The University places a strong emphasis on green practices and environmental conservation by integrating relevant courses into its academic programs. These courses equip students to engage with the community, identify sources of pollution, and develop effective management strategies. Moreover, students are encouraged to actively raise awareness among community members regarding pollution control measures and the critical importance of maintaining a clean and green environment.

Research Initiatives

In alignment with Sustainable Development Goal (SDG) 12, the University conducts innovative research to ensure the sustainable management of energy, water, and waste resources. Key initiatives include the development of advanced water purification technologies and cost-effective wastewater treatment solutions to enhance water quality and accessibility. Researchers focus on designing efficient water recycling systems and sustainable irrigation methods to optimize water usage in both agricultural and urban environments. Studies addressing the impacts of climate change on water resources inform adaptive conservation and management strategies. Additionally, the University explores the integration of smart technologies for real-time water quality monitoring and leakage detection to improve the efficiency of water distribution systems. Through collaborations with government agencies, industries, and international organizations, the



University contributes to pioneering solutions that address challenges related to water scarcity, pollution, and sanitation, promoting sustainable development and resilience in water resource management.

Research Projects

The University provides research funds to promote the research for conduction of research ([Intramural-Project-2024-Sanctioned-4.pdf](#)). To name a few intramural projects funded by the university are show below:

S. No.	Name of the project	Duration of the project	Name(s) of the teacher(s) working in the project receiving seed money	The amount of seed money provided (INR in lakhs)	Year of receiving the seed money
1.	Demineralized Water Consumption: Unravelling Current Trends and Health Effects (Research article)	06 Months	Dr. Nupur Joshi, Dr. Nikku Yadav, Dr. Ashutosh Kumar Choudhary, Dr. Deep Shika, Ms. Shweta Samant	0.3	Till December 2023
2.	Emerging threats in Aquaculture: Bibliometric Analysis of Aeromonas spp. as an emerging pathogen	04 Months	Nupur Joshi, Dr. Geeta Bhandari, Dr Archana Dhasmana, Dr Vikash Singh Jadon, Dr. Sanjay Gupta	0.15	Till December 2023
3.	Roof Top Rain Water Harvester	09 Months	Dr. H.P. Uniyal	0.3	Till December 2023

Several intramural projects funded by the University exemplify its commitment to advancing scholarly work. Additionally, the University actively secures extramural funding from national agencies to support research and initiatives aligned with Sustainable Development Goal 12 (SDG 12). These funds enable the development and implementation of projects focused on enhancing water accessibility, quality, and sustainability. They also facilitate the establishment of advanced infrastructure, such as state-of-the-art water treatment and recycling facilities, and support



impactful research on innovative technologies for water purification, wastewater management, and groundwater recharge. Collaborative projects funded through these resources address critical challenges like water scarcity, pollution, and sanitation in both rural and urban contexts. Furthermore, the funds are utilized to organize community outreach programs, capacity-building workshops, and awareness campaigns, fostering sustainable water usage and hygiene practices.

Research Publications:

The University is dedicated to promoting Sustainable Development Goal 12 (SDG 12) through impactful research and scholarly contributions. Faculty members and researchers consistently publish their findings in peer-reviewed journals, showcasing innovative approaches to addressing water and sanitation challenges. These publications focus on critical topics such as advanced water purification technologies, wastewater treatment, rainwater harvesting, groundwater management, and the effects of climate change on water resources ([Scopus - Swami Rama Himalayan University](#)).

Gupta, A.K., Boruah, T., Ghosh, P., ...Vijay, K., Rustagi, S. Green chemistry revolutionizing sustainability in the food industry: A comprehensive review and call to action, *Sustainable Chemistry and Pharmacy*, 2024.

Ritika,, Bora, B., Ismail, B.B., ...Kumar, H., Gupta, A.K. Himalayan fruit and circular economy: nutraceutical potential, traditional uses, challenges and opportunities, *Food Production, Processing and Nutrition*, 2024.

Bhatt, A., Joshi, P., Joshi, K.P., Bijalwan, A. Advanced technologies for realizing sustainable development goals: 5G, AI, big data, blockchain, and Industry 4.0 application, *Advanced Technologies for Realizing Sustainable Development Goals: 5G, AI, Big Data, Blockchain, and Industry 4.0 Application*, 2024.



Gupta, A.K., Fadzlillah, N.A., Sukri, S.J.M., ...Bhuyan, S., Rustagi, S. Slaughterhouse blood: A state-of-the-art review on transforming by-products into valuable nutritional resources and the role of circular economy, *Food Bioscience*, 2024.

Trivedi, A., Trivedi, N. Integrating circular economy in smart cities: Challenges and pathways to sustainable urban development, *Smart Cities and Circular Economy: The Future of Sustainable Urban Development*, 2024.

Rajput, V., Saini, I., Parmar, S., Naik, B.S., Rustagi, S. Biochar production methods and their transformative potential for environmental remediation, *Discover Applied Sciences*, 2024.

Kumari, A., Gupta, A.K., Sharma, S., Chun, S.C., Sivanesan, I. Nanoparticles as a Tool for Alleviating Plant Stress: Mechanisms, Implications, and Challenges, *Plants*, 2024.

Joshi, A., Gupta, A.K., Mansi, Rustagi, S., Preet, M.S. Sustainable solutions for food security: Evaluating pre-treatment technologies in the growing fruits and vegetables industry of India, *Sustainable Chemistry and Pharmacy*, 2024.

Rana, G., Arya, V. Green human resource management and environmental performance: mediating role of green innovation – a study from an emerging country, *Foresight*, 2024.

Rana, G., Sharma, R., Parashar, B. Application of Artificial Intelligence for the Success of Supply Chain Operations in the Age of Data Analytics, *2024 International Conference on Smart Devices, ICSD 2024*, 2024.

Joshi, P., Bhatt, A., Aggarwal, G. Fishers 4.0: Revolutionizing Contemporary Fisheries Management through Industry 4.0 Integration, *Proceedings - 2024 International Conference on Healthcare Innovations, Software and Engineering Technologies, HISET 2024*, 2024.



Santhanam, A., Dhasmana, A., Sati, A., Bhandari, G., Gupta, S. Green Synthesis of Al_2O_3 Nanoparticles from Agro-Waste as a Sustainable Approach, *Proceedings - 2024 International Conference on Healthcare Innovations, Software and Engineering Technologies, HISET*, 2024.

Uniyal, A., Kaushik, N., Uniyal, H.P. United nations sustainable development goals in the context of hydrological extremes, *Water Sustainability and Hydrological Extremes: Quantity, Quality, and Security*, 2024.

Chandra, S., Joshi, N. Probiotics in Aquaculture, *Handbook of Aquatic Microbiology*, 2024.

Gupta, A.K., Vijay, K., Naik, B.S.S.S., Mishra, P. Introduction, *Edible Flowers: Health Benefits, Nutrition, Processing, and Applications*, 2024.

Al-Adwan, A.S., Meet, R.K., Anand, S., Alsharif, R., Dabbaghia, M. Understanding continuous use intention of technology among higher education teachers in emerging economy: evidence from integrated TAM, TPACK, and UTAUT model, *Studies in Higher Education*, 2024.

Bhandari, G., Chaudhary, P., Gangola, S., Rafatullah, M., Chen, S. A review on hospital wastewater treatment technologies: Current management practices and future prospects, *Journal of Water Process Engineering*, 2023.

Harish, V., Sharma, R., Rana, G., Nayyar, A. Artificial Intelligence in Sustainable Education: Benefits, Applications, Framework, and Potential Barriers, *The Role of Sustainability and Artificial Intelligence in Education Improvement*, 2023.

Gupta, A.K., Pratiksha, Das, T., ...Ranjan, R., Mishra, S. Novel food materials: Fundamentals and applications in sustainable food systems for food processing and safety, *Food Bioscience*, 2023.



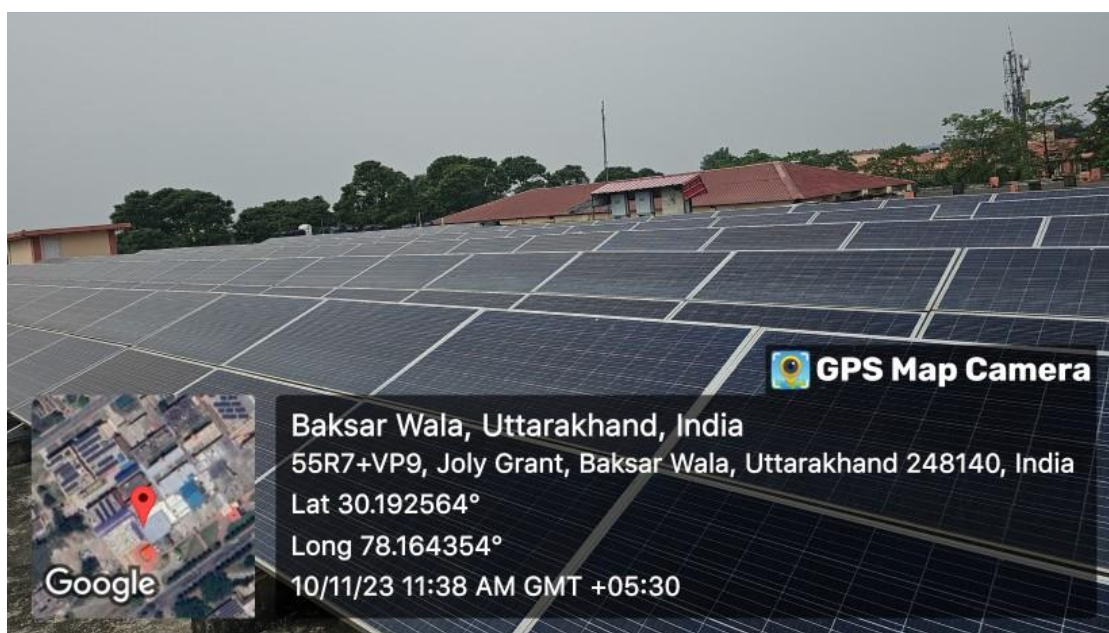
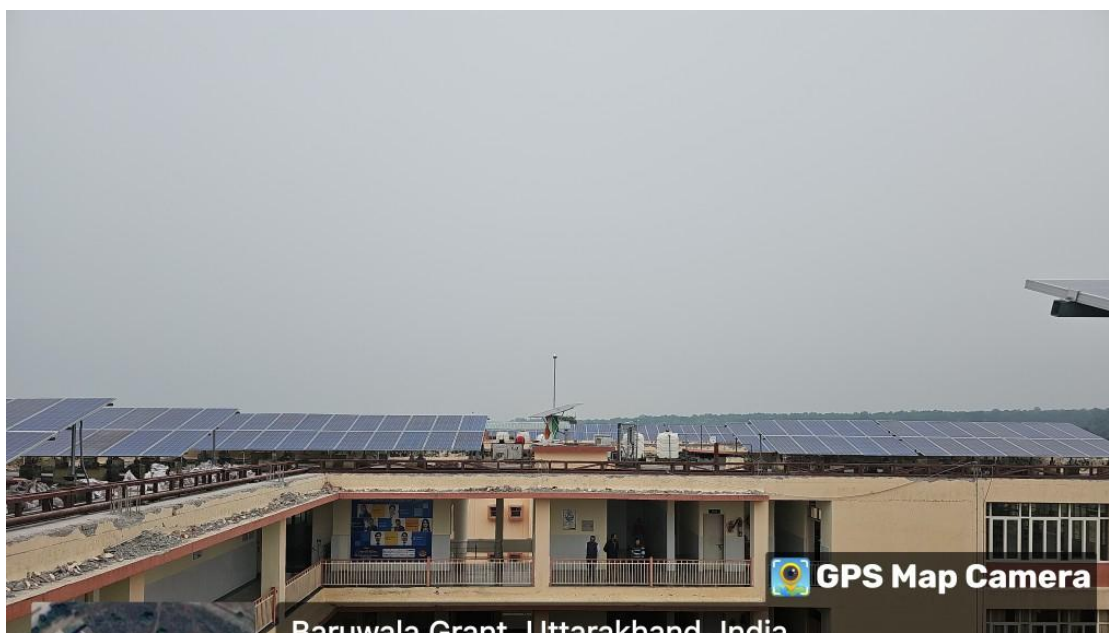
Reduced Energy Consumption

In response to climate change and the growing global demand for sustainable energy sources, Swami Rama Himalayan University (SRHU) has taken significant strides in adopting eco-friendly practices. A notable initiative is the installation of a 1500 KW rooftop solar power plant on the SRHU campus. This forward-thinking project not only underscores the University's commitment to environmental sustainability but also serves as an educational resource for students and the broader community. The solar power plant greatly reduces the University's carbon footprint by minimizing reliance on fossil fuels, thereby decreasing greenhouse gas emissions. Additionally, it conserves water resources, as solar energy production requires far less water compared to conventional power generation methods. The plant also enables substantial cost savings by generating on-site electricity, allowing the University to reinvest in educational initiatives and further sustainable projects. Looking ahead, SRHU has signed an agreement with M/S Bakshi Engineering Works, Dehradun, to expand its renewable energy efforts with an additional 1000 KW rooftop solar power plant.

To further enhance energy efficiency, the University has implemented measures to reduce electricity consumption across campus facilities, including lighting, air conditioning, lifts, water mining, and other equipment. A key initiative is the widespread adoption of LED lighting, which consumes up to 80% less electricity than traditional incandescent and fluorescent bulbs. This switch has significantly reduced energy consumption, lowered electricity bills, and diminished the campus's carbon footprint, aligning with SRHU's commitment to combating climate change. SRHU has also introduced smart lighting systems powered by LEDs, which use sensors and automated controls to adjust lighting based on occupancy and ambient light conditions. This technology ensures minimal energy waste by activating lights only when and where needed, further advancing the University's sustainability objectives.

In addition to lighting innovations, SRHU has embraced Brushless Direct Current (BLDC) fans across its campus. These fans are highly energy-efficient, consuming significantly less electricity than traditional AC fans while providing equal or superior airflow. The use of BLDC fans has resulted in considerable cost savings and contributes to a more sustainable campus operation.

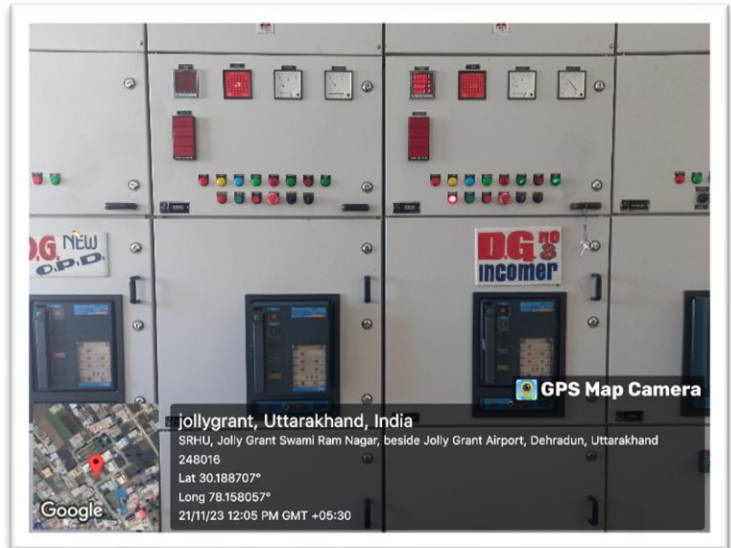
Moreover, their durability and low maintenance requirements ensure a longer lifespan and reduced operational costs, reinforcing the University's focus on efficiency and sustainability. Through these initiatives, SRHU demonstrates its unwavering commitment to fostering a greener, more sustainable campus, setting a benchmark for environmental stewardship in higher education.



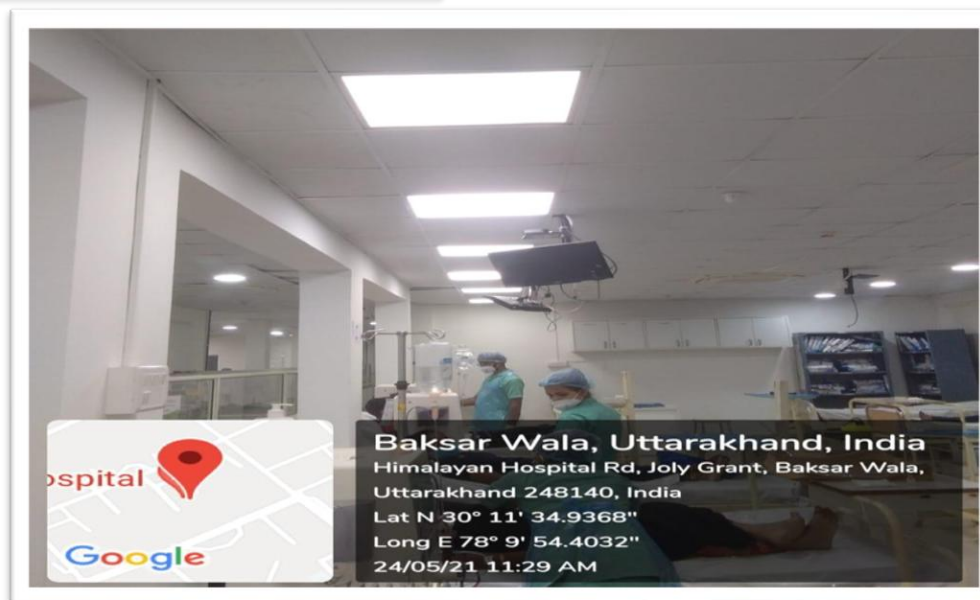
View of solar system in the campus



**Motion sensor based sensor LED lights
for energy conservation**



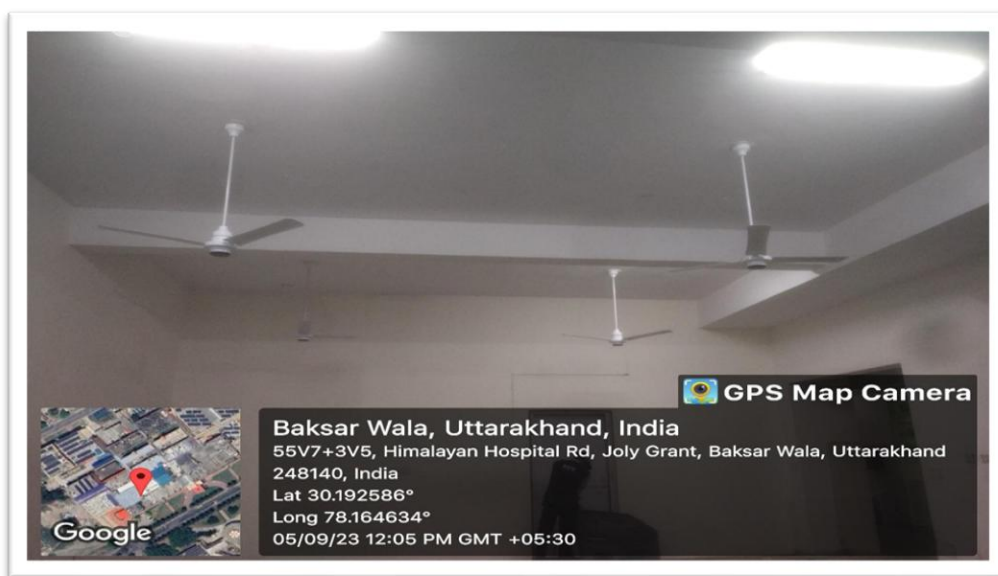
**Diesel Generator Set panels with Automatic
mains failure (AMF) and load balancing**



Use LED lights for energy conservation



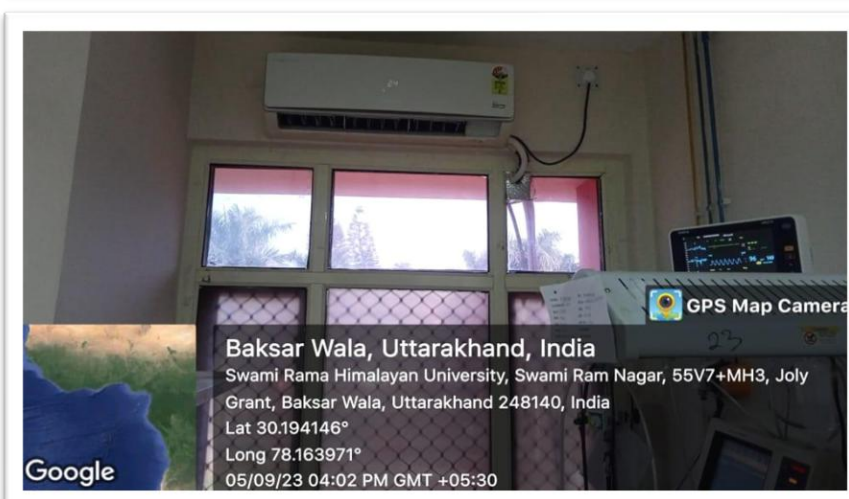
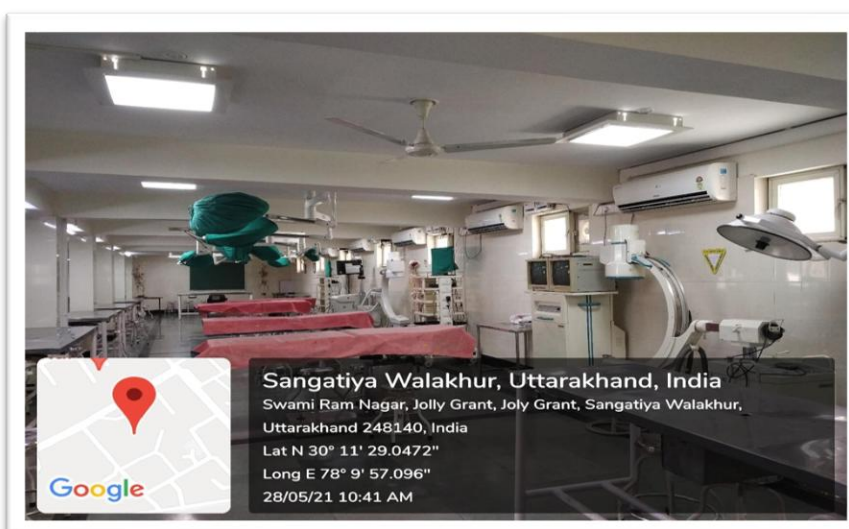
Use LED lights for energy conservation



Use of LED bulbs/ BLDC Fans

Uses of BEE Star-rated Air conditioners

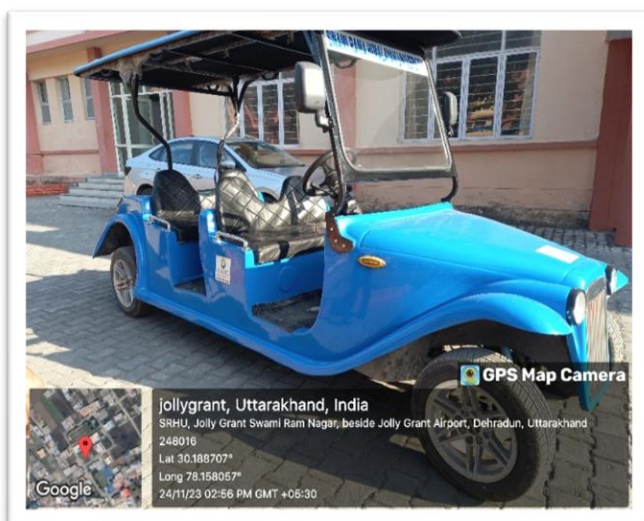
In its efforts to establish a sustainable and environmentally responsible campus, SRHU has made a notable advancement by integrating BEE (Bureau of Energy Efficiency) star-rated air conditioners. This initiative reflects the University's commitment to environmental stewardship while offering several advantages, including enhanced energy efficiency, cost savings, and improved indoor comfort. The lower energy consumption of BEE star-rated air conditioners leads to reduced electricity costs for SRHU, allowing these financial savings to be redirected toward further campus sustainability projects and academic programs.



Use of BEE star rated Air conditioners

Use of Battery-Powered Vehicles

The integration of electric vehicles (EVs) into the SRHU campus offers a key environmental benefit by significantly reducing greenhouse gas emissions. By replacing fossil fuel-powered vehicles with EVs, SRHU has made substantial strides in lowering its carbon footprint, contributing to a cleaner and healthier environment. Electric vehicles now provide an efficient and sustainable mode of transportation for faculty, staff, and campus shuttles, as well as for maintenance purposes. To further promote the adoption of EVs, SRHU has strategically installed charging infrastructure at key locations across the campus, making it easier for users to charge their vehicles and supporting the transition to greener transportation options.



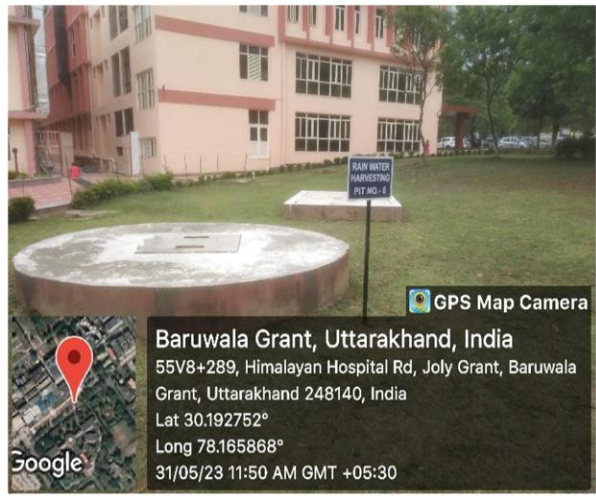
Battery Powered Vehicle

Water usage and Conservation

Water scarcity is an escalating global challenge, and with climate change increasingly disrupting weather patterns, it is vital to explore innovative solutions to address this issue. Rainwater harvesting is one such sustainable practice that offers significant potential in mitigating water shortages and reducing dependence on conventional water sources. This age-old technique involves collecting and storing rainwater for various uses, such as drinking, irrigation, and household needs. The process typically begins with capturing rainwater from rooftops, followed by filtration and storage. On the SRHU campus, rainwater is collected from the roof of the medical college building and stored in a 150 KL capacity underground tank. This water is then utilized for non-potable purposes, such as toilets and cleaning. In addition, excess rainwater is directed into the ground through infiltration wells strategically placed throughout the campus. This method not only reduces pressure on freshwater resources but also helps replenish underground aquifers, fostering sustainable groundwater management and contributing to the overall environmental sustainability of the campus.



Rainwater harvesting pits with filter bed recharge near hospital building

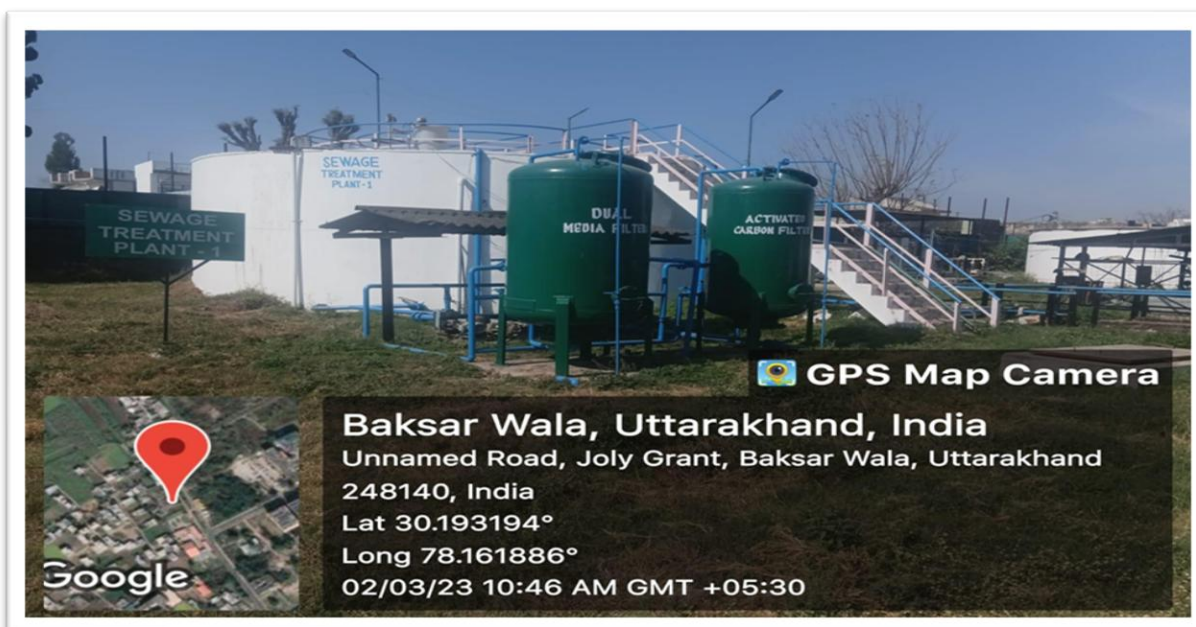


Ground water recharge setup

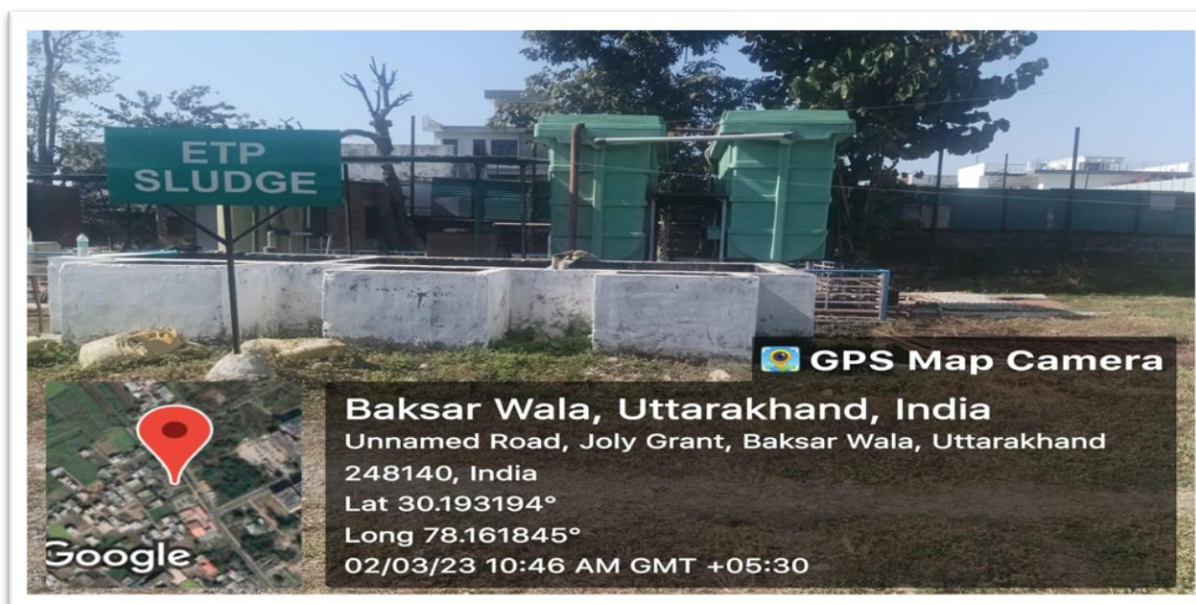
Waste Management facility in the University

The SRHU campus, including the hospital, utilizes an advanced Sewage Treatment Plant (STP) with a capacity of 1 MLD, employing MBBR technology and an extended aeration-activated sludge process to treat sewage. The treated water meets the quality standards set by the state pollution control board and is repurposed for irrigation in parks and green spaces on campus, ensuring both environmental compliance and sustainability. In addition, SRHU has established a 90 KLD Effluent Treatment Plant (ETP) to address the substantial daily wastewater generated from various campus activities, including laboratory operations and laundry. This plant effectively treats wastewater, mitigating environmental risks and maintaining public health and campus aesthetics. The recycled water is then used for non-potable purposes, such as irrigation, thereby conserving valuable freshwater resources and reinforcing the University's commitment to environmental stewardship and sustainable campus management.





Sewage Treatment Plant (STP) at SRHU



Effluent Treatment Plant (ETP) at SRHU



Waste to energy production: Biogas plant

Liquid Waste Management Policy: ([View Document](#))

E-Waste Management

Electronic waste, or e-waste, has become a rapidly growing global concern due to the increasing rate of technological advancements and the shorter lifespan of electronic devices. Improper disposal of e-waste poses significant environmental risks, as it often contains hazardous materials such as lead, mercury, and cadmium. In response to this issue, SRHU has taken a proactive approach by establishing the E-Waste Store, a dedicated facility on campus for the responsible disposal and recycling of electronic devices. This convenient on-campus resource provides a simple solution for students, faculty, and staff to safely dispose of old and unwanted electronic equipment. All e-waste is processed with approval from IT experts, ensuring that data privacy concerns are addressed. The University follows a clear policy for managing e-waste through government-approved vendors. These vendors are invited to the E-Waste Store, where the e-waste is collected and disposed of according to government rules and regulations.

A certificate of e-waste disposal is provided by the vendor to the University for official records, ensuring accountability and compliance with environmental standards.



Tanks for Water Storage

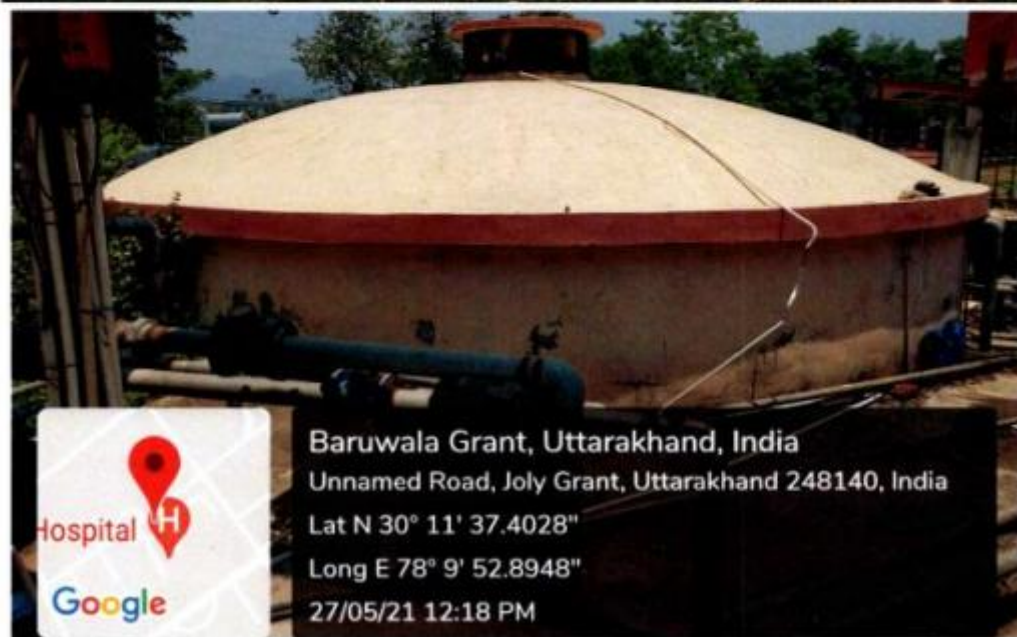
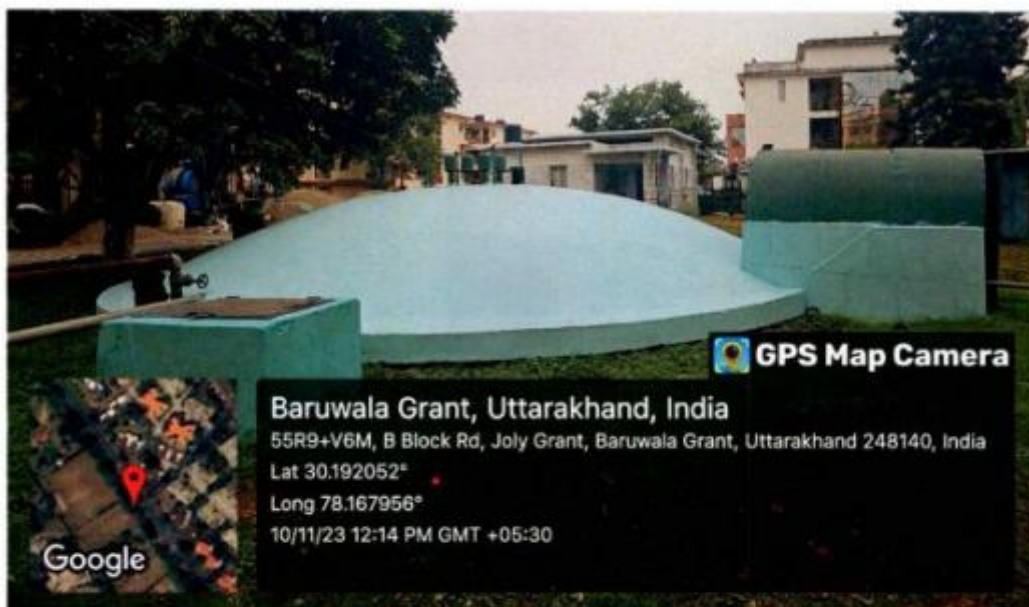
SRHU emphasizes the use of tanks and bunds as an integral part of its sustainable water management practices. These structures are vital for conserving water, preventing soil erosion, and supporting groundwater recharge. Key initiatives include:

1. Water Storage Tanks: Constructing large tanks to store rainwater and treated water for irrigation and other non-potable uses.
2. Bunding Systems: Establishing bunds in key areas to capture surface runoff and direct it to recharge pits or water bodies.

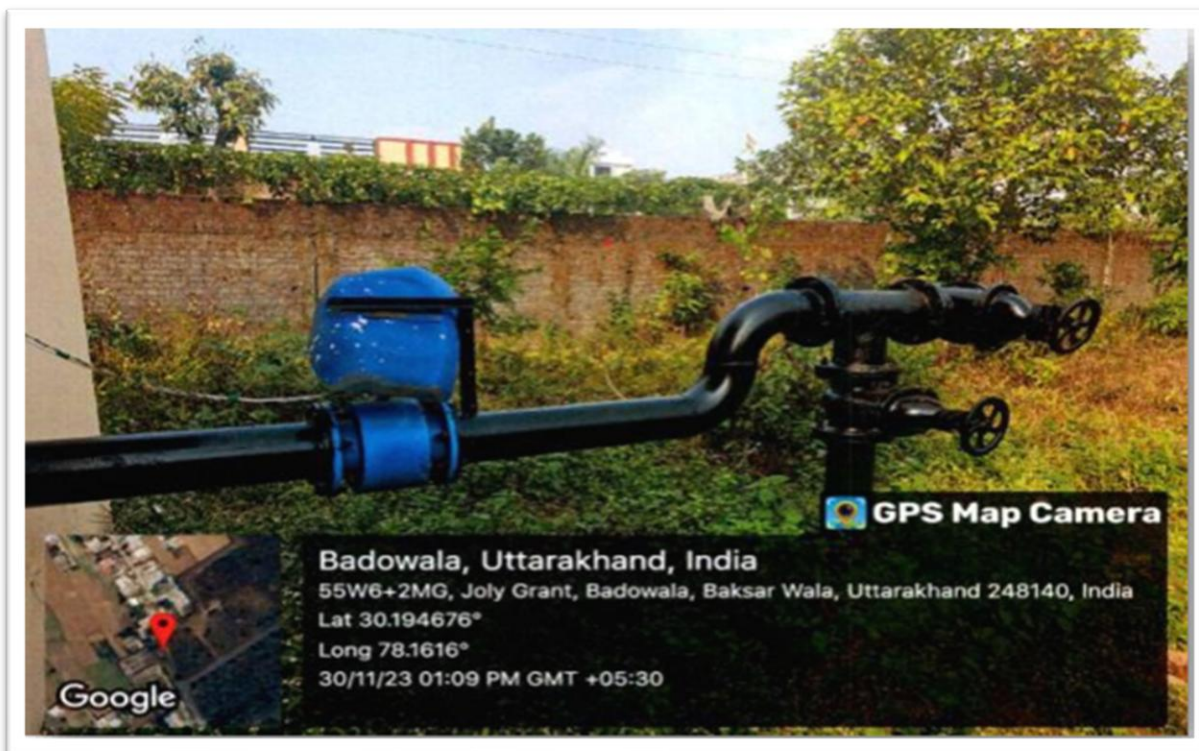
3. Erosion Control: Using bunds to prevent soil erosion and enhance soil moisture retention in landscaped and agricultural areas.
4. Groundwater Recharge: Designing tanks and bunds to channel excess water into aquifers, thereby maintaining groundwater levels.
5. Community Awareness: Educating the campus community on the importance and functioning of tanks and bunds in sustainable water management.
6. Integration with Landscaping: Incorporating tanks and bunds into the campus landscaping plan to maximize water conservation benefits.



Underground water storage tank



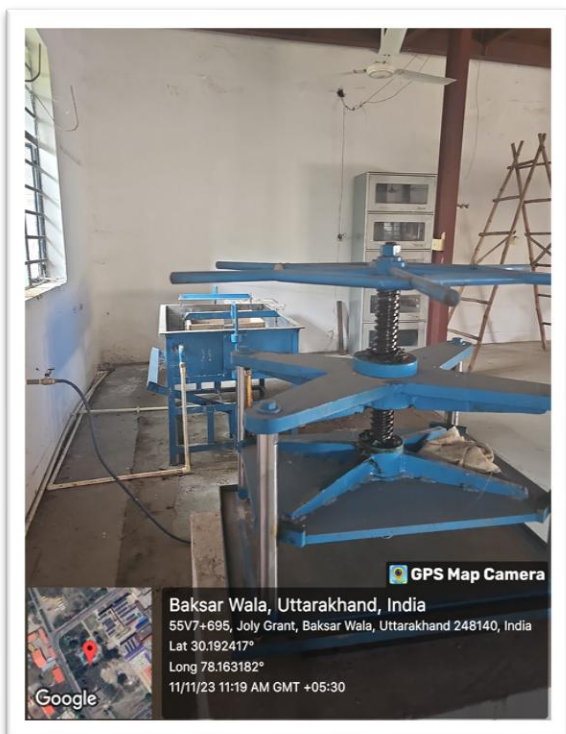
Underground water tanks (Tube well Chowk- 150 KL and behind the main Hospital building- 175 KL)



Chlorination of water and distribution system

Recycling of Paper/ Waste:

SRHU has implemented several sustainable waste management initiatives to minimize environmental impact on campus. The University operates an 8 kg per day waste paper recycling plant, which processes paper waste collected from various offices and schools. The resulting recycled handmade paper is repurposed into envelopes used within university offices, promoting a circular economy. In addition, biodegradable waste from across the campus is processed in a compost pit, producing organic fertilizer that supports the university's nursery and gardens. To further enhance its sustainability efforts, SRHU runs a Bio-Gas plant near the university guest house, which utilizes cow dung from the campus dairy and vegetable waste from the guest house kitchen. This bio-gas is used for cooking and to support organic waste recycling, contributing to both energy production and waste reduction on campus. These initiatives reflect SRHU's commitment to environmental stewardship and sustainable resource management.



Waste paper recycling unit



Biogas Plant at SRHU

Ban on Use of Plastic

Plastic pollution poses a significant threat to ecosystems, wildlife, and human health, and SRHU is actively taking steps to combat this issue by reducing plastic consumption across the campus. The production of plastics requires valuable resources such as fossil fuels and water, and by promoting a plastic-free SRHU, the University is conserving these resources while also minimizing the carbon footprint associated with plastic production and disposal. As plastics break down into microplastics, they pose health risks by potentially contaminating the food chain. By striving for a plastic-free campus, SRHU not only contributes to environmental protection but also fosters a healthier and safer campus environment. Additionally, SRHU's commitment to reducing plastic waste serves as an educational platform, raising awareness about the detrimental effects of plastic pollution and the importance of sustainable alternatives. To further its efforts, SRHU has partnered with the NGO "Social Development for Communities Foundation" in Dehradun to establish a plastic bank on campus. The collected plastic from the campus and surrounding areas is sent to the Indian Institute of Petroleum in Dehradun, where it is recycled into diesel, supporting both waste reduction and renewable energy initiatives.



Biogas Plant at SRHU

Solid Waste Management Practices

The university effectively manages solid waste by segregating biodegradable and non-biodegradable materials at the source, using green and black bins placed throughout the campus. Housekeeping staff collect the waste daily in color-coded bags and transport it to a central collection site. Biodegradable waste is composted on-site to create manure, while a biogas plant generates biogas from cow dung and organic kitchen waste.



Collection of solid (general) waste from residences and hostels



Pit for organic waste composting

Landscaping for the Green Campus

Landscaping plays a crucial role in promoting a green and sustainable campus at Swami Rama Himalayan University. By incorporating native plants, eco-friendly designs, and sustainable practices, the University enhances its aesthetic appeal while supporting biodiversity and environmental conservation. Thoughtfully designed green spaces, including gardens, tree-lined pathways, and water features, help reduce the carbon footprint, improve air quality, and create a tranquil environment that supports learning and well-being. Furthermore, initiatives such as organic waste composting, rainwater harvesting systems, and the use of low-maintenance plants further reinforce the University's commitment to sustainability and ecological responsibility. These efforts reflect SRHU's dedication to achieving a harmonious balance between growth and environmental stewardship, ensuring a sustainable and thriving campus for future generations.



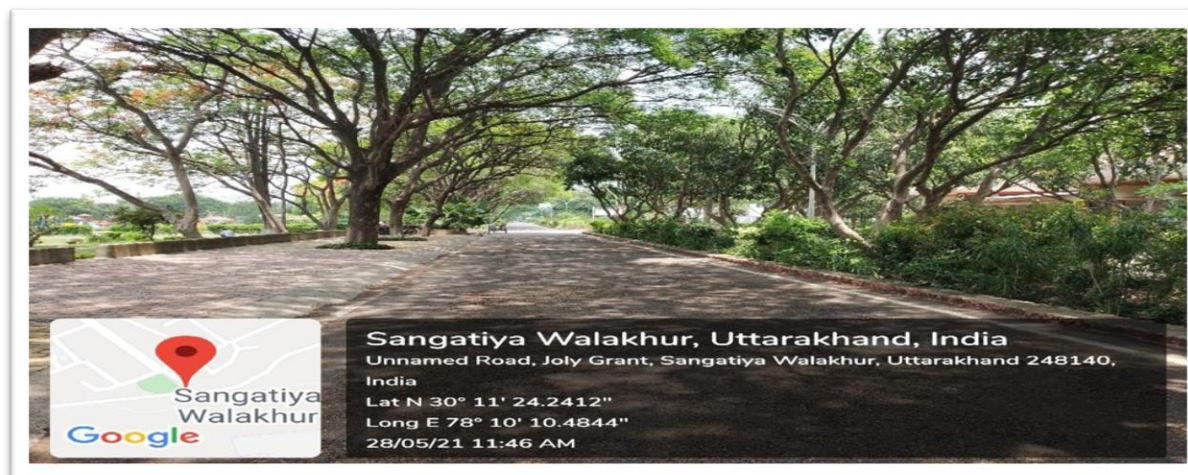
Landscaping for Green campus

Plantation in the campus

SRHU is dedicated to fostering a sustainable and environmentally conscious campus. One of the most impactful steps taken towards achieving this vision is the extensive tree plantation initiative within the university premises. Trees act as natural air filters, absorbing pollutants and releasing oxygen. This significantly contributes to improved air quality on campus, creating a healthier atmosphere for all. Trees provide shade and reduce the heat island effect, helping to maintain a comfortable and cooler campus environment, especially during hot seasons. SRHU's tree plantation initiative includes a wide variety of indigenous and exotic tree species carefully chosen to thrive in the local climate and conditions.



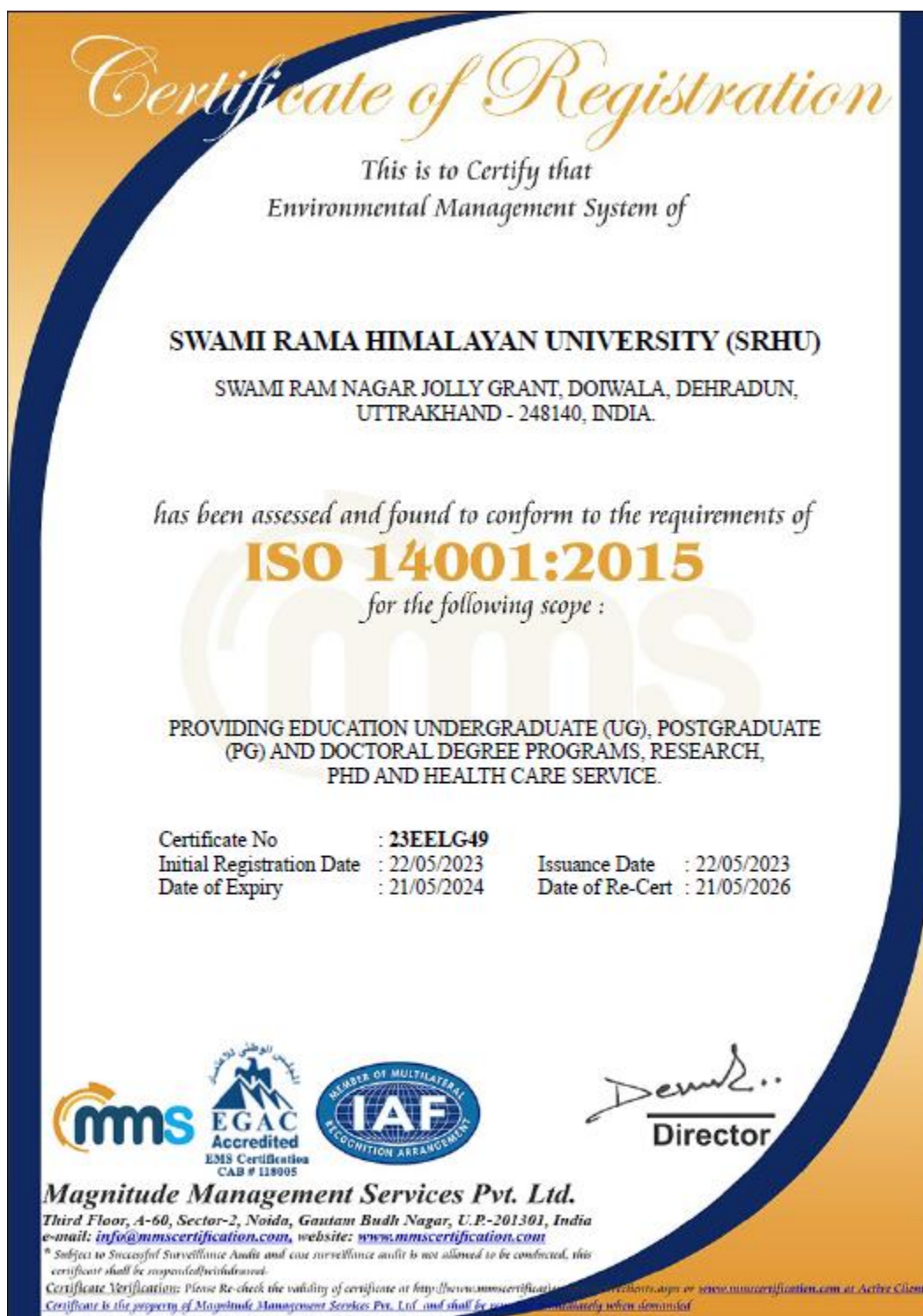
Plantation drives for Green campus



Green campus @SRHU

Certifications

SRHU consistently adheres to audit procedures for energy, environment, and green campus initiatives. Through these efforts, the University upholds quality standards and ensures compliance with ISO regulations set by government-approved agencies. Notably, the University maintains an active ISO 14001:2015 and ISO 50001: 2018 certification in its records.





CARBON FOOTPRINT CERTIFICATE 2023-24

PRESENTED TO

Swami Rama Himalayan University

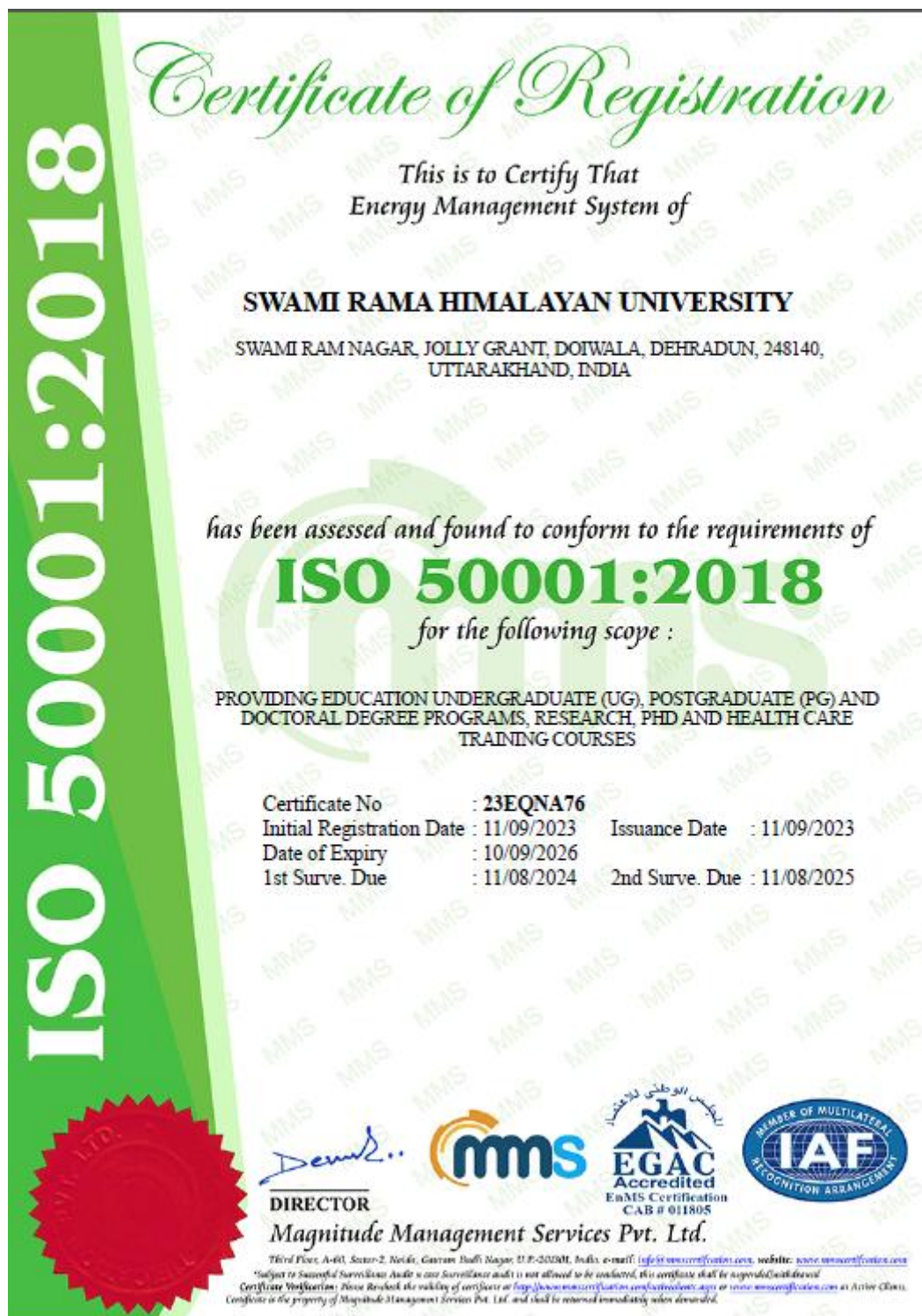
Swami Ram Nagar, Doiwala, Dehradun, Uttarakhand, India

Scope of GHG emissions	tCO ₂ e	%
Direct emissions to air	858	9.4
Indirect emissions from purchased energy	10	0.11
Other indirect emissions	8260	90.4
Total tCO₂e	9,128	


Dr. Gurpreet Singh
(Authorized Signatory)
Lead Auditor - Green & Environment Audits
Ecoscience Consultancy, Uttarakhand

Date: 24/07/2024







Swami Rama Himalayan University

(Estd. Under section 2(f) of UGC Act, 1956 vide Uttarakhand State Act)

Swami Ram Nagar, Jolly Grant, Dehradun 248016
Uttarakhand, India



स्वामी राम हिमालयन विश्वविद्यालय

(बुकाई अधिनियम, 1956 की धारा 2 (f) के अंतर्गत उत्तराखण्ड राज्य अधिनियम द्वारा स्थापित)

स्वामी राम नगर, जौलीग्रान्ट, देहरादून 248016
उत्तराखण्ड, भारत

To whom it may concern

This is to certify that the Material Management Department has successfully participated in the collection and recycling of electronic e-waste and general waste in accordance with environmental standards for contributing towards sustainable waste management and its disposal under environmental conservation efforts.

These wastes are regularly collected from all constituent academic units and Hospitals for storing it in waste collection zone located inside the campus.

The details of e-waste and general wastes collected in year 2023-24 is given below:

S.No.	Weight in Kg	Type of Waste
1	26537.5	Medical Equipment, Electronic & IT and telecom equipments etc.
2	79612.5	Paper Scrap, Iron, Tin & Plastic etc.
Total	106150	

Roshan Naugain
Manager
(Material Management Department)

Date: 22/07/24