SDG 12: Responsible Consumption and Production
(Report 2023-24)

12.1 Research on responsible consumption and production

K.R. Mangalam University demonstrates a strong research commitment to Responsible Consumption and Production, contributing to the advancement of sustainable production systems, waste reduction strategies, and efficient resource management. Between 2014 and 2024, the university produced 1,042 Scopus-indexed publications, of which 152 are aligned with the United Nations' Sustainable Development Goal 12, highlighting a sustained focus on sustainability-driven innovation. These publications collectively achieved 3,332 paper views, a citation index of 22.30, and a Field Citation Average (FCA) of 6.06, reflecting the depth and influence of the university's work in promoting sustainable development practices.

12.1.1: Responsible Consumption and Production – CiteScore

In 2024, the Cumulative CiteScore of 69.2 indicates that the university's research on responsible production and consumption is being widely recognized within the academic and industrial research communities. This performance demonstrates strong engagement with topics such as circular economy, waste valorization, sustainable supply chains, renewable energy integration in manufacturing, and eco-innovation, reflecting both scholarly quality and societal impact.

12.1.2: Responsible Consumption and Production – FWCI

The average Field-Weighted Citation Impact (FWCI) of 3.21 highlights that K.R. Mangalam University's Responsible Consumption and Production related publications are cited more than three times the global average, indicating exceptional research visibility and influence. The elevated FWCI reflects the quality of interdisciplinary collaboration across environmental science, materials research, and industrial engineering aimed at sustainable technological and behavioral transformation.

12.1.3: Responsible Consumption and Production – Publications

The 152 Responsible Consumption and Production aligned publications represent a significant contribution to advancing responsible consumption and production models. By emphasizing green innovation, life-cycle assessment, and efficient resource utilization, K.R. Mangalam University continues to drive impactful research that supports sustainable industry and consumption patterns.

12.2 Operational measures

12.2.1 Ethical Sourcing Policy

K R Mangalam University's Ethical Sourcing Policy ensures that all procurement practices align with sustainable resource use and responsible production. We source materials and services only from suppliers who follow ethical labour standards, minimise environmental impact, and demonstrate transparency in their operations.

By prioritizing sustainability and accountability across our supply chain, we promote fair trade, reduce resource depletion, and support the global effort towards Responsible Consumption and Production.

Sustainable Environment and Green Campus Policy

Link of Agreement with Food Supplier 'Pawan Enterprises'

Resource Efficiency:

K.R. Mangalam University promotes ethical and resource-efficient procurement practices to ensure that all goods and services—particularly food, stationery, and institutional supplies—are sourced responsibly. The University prioritizes vendors who adhere to environmental sustainability, and local sourcing principles, thereby reducing the carbon footprint associated with transportation and production. Through this policy, K R Mangalam University encourages the use of eco-friendly, recyclable, and energy-efficient materials, supporting both economic fairness and sustainable consumption.

Sustainable Environment and Green Campus Policy

Electricity & Water Conservation Measures

K.R. Mangalam University has adopted comprehensive electricity and water conservation measures in accordance with its *Sustainable Environment and Green Campus Policy (2024)*.

The University promotes efficient resource utilization through the installation of LED lighting systems, smart meters, motion sensors, and energy-efficient HVAC and BLDC fans to reduce overall power consumption. On the water front, K R Mangalam University operates a Sewage Treatment Plant (STP) to recycle wastewater for horticulture, flushing, and cooling purposes, alongside rainwater harvesting systems for groundwater recharge. Low-flow fixtures, dual-flush cisterns, and drip irrigation systems further ensure optimal water use. These initiatives collectively contribute to the University's goal of reducing freshwater consumption by 50% and achieving a 25% reduction in energy intensity by 2027, reinforcing its commitment to environmental sustainability and national energy conservation targets.

Sustainable Environment and Green Campus Policy

Water reuse policy

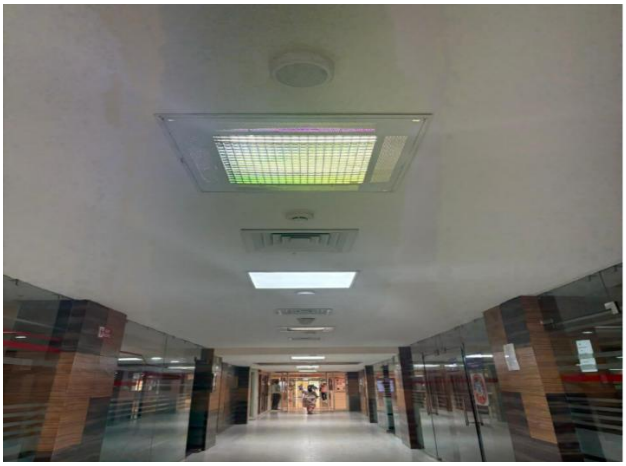
Reduced use on conventional electricity

By using a variety of automated tools and techniques the university routinely makes arrangements to lower the amount of electricity used for lighting, air conditioning, elevators, water mining, instruments, and other devices:

Installing smart LED lights/sensor lights greatly reduces energy use. The campus's energy consumption can be decreased by adopting the practice of turning off the lights and fans when leaving a room for longer than five minutes, and the air conditioners if you're going to be gone for more than thirty minutes.

Motion sensors have been installed in school restrooms and common spaces to save energy usage when the space is empty for longer than three minutes.

Rooftop solar panels



LED Motion-sensor lighting

Decrease in water use

The most vital natural resource for maintaining life on Earth is water. Ineffective dispensing and storage systems, as well as inappropriate consumption patterns, result in significant water waste.

The following steps are will be taken to reduce the quantity of water used:

- Whenever feasible, sprinkler and drip irrigation systems are utilized to water lawns, trees, plants, etc.
- Sensor taps.

Sprinkler system in Sunken Garden promoting water efficiency and sustainable campus landscaping at K R Mangalam University.

Drip irrigation at K R Mangalam University promoting efficient water use and eco-friendly campus maintenance

Automatic sensor taps at K R Mangalam University ensuring water efficiency and improved hygiene standards

12.2.3 – Policy on Waste Disposal: Hazardous Materials

KR Mangalam University has implemented a Waste Disposal and Management Policy as part of its responsible consumption and production efforts. The policy ensures that all hazardous materials are identified, handled, stored, transported, and disposed of safely in compliance with national environmental and safety regulations. This policy reflects our commitment to sustainable operations and responsible resource management, reducing risks associated with hazardous waste and supporting a cleaner, safer environment.

We follow strict procedures to minimize environmental impact, prevent contamination, and protect the health and safety of our employees and communities. All waste is managed through authorized disposal agencies to ensure adherence to best practices. The following waste categories are systematically monitored and managed through designated policies and vendor linkages:

S. No.	Type of Waste	Description / Documents
1	E-Waste	Refurbished Products are refurbished by Pro Dot Authorized recyclers, which includes the functionality testing, basic cleaning, inspection and repackaging as per E-Waste (Management) Rules, 2022. Safely Disposal of Hazardous E-Waste MoU

2	Solid Waste	Non-biodegradable waste is collected separately at source; processed as per Solid Waste Management Rules 2016. Agreement for garbage collection services
3	Liquid Waste	Processed in the university's sewage treatment plants and used for irrigation & horticulture, conforming to the Water (Prevention and Control of Pollution) Act, 1974. HSPCB consent to K R MANGALAM UNIVERSITY for STP
4	Biotic Waste	This encompasses organic and garden waste, which is composted on campus to make manure for the greens in Spring. Agreement for biomedical waste disposal

***Collaborations to deal with Hazardous materials*:**

K.R. Mangalam University has teamed up with licensed local waste management agencies for hygienic disposals of the hazardous wastage generating on campus. E-waste generated by IT labs and offices is periodically Through these partnerships, the University is committed to responsible waste management, limiting its environmental footprint and meeting all relevant national sustainability and safety criteria. For this university has signed MOU / agreement with Biotic Waste Limited.

Link for Waste disposal MoU: Hazardous waste & scrap disposal MoU.pdf

12.2.4 Policy waste disposal - landfill policy

By using efficient segregation, recycling, and appropriate disposal techniques, the organisation is dedicated to reducing the amount of waste that ends up in landfills. Reuse and sustainable resource management are prioritised in order to cut waste production at its source. The amount of waste that is recycled and dumped in landfills is measured regularly.

Sustainable Environment and Green Campus Policy

Decrease in the Production of Solid Waste, Both Biodegradable and Non-Biodegradable

- Periodic **Environmental, Green, and Energy Audits**

Environmental Audit Report:

- https://www.krmangalam.edu.in/pdfs/sdg/sdg-12/SDG-12-audit-report-environmental-audit-krmu-23-05-2025.pdf

Energy Audit Reports:

- https://www.krmangalam.edu.in/pdfs/sdg/sdg-12/SDG-12-audit-report-energy-audit-krmu-23-05-2025.pdf

Green Audit Reports:

- https://www.krmangalam.edu.in/pdfs/sdg/sdg-12/SDG-12-audit-report-green-audit-krmu-23-05-2025.pdf
- Vendor tie-ups with authorised contractors for disposal and recycling
- Link for Waste disposal MoU

Colour-coded bins across K R Mangalam University promoting source-level waste segregation and responsible recycling

Waste Segregation and Recycling Infrastructure

The University has adopted colour-coded segregation bins across all blocks: **Green** – Biodegradable waste, **Blue** – Recyclable dry waste, **Yellow**– Non-Biodegradable / Hazardous Waste

Segregation at source is ensured through regular training of housekeeping staff, students, and faculty. The University has established:

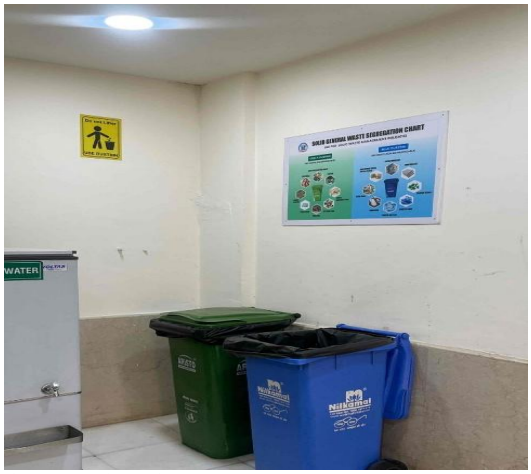
- **Composting pit and vermicomposting unit** for organic waste
- **Biogas plant** for food waste from hostels and cafeteria

- **Central waste storage zone** for temporary segregation before collection by authorized vendors

Type-wise Waste Management

a. Solid Waste

- Biodegradable waste (food waste, leaves) is processed into organic compost and used for landscaping.
- Paper and cardboard waste are sold to authorised scrap vendors.
- Plastic and metal waste are collected by contracted recyclers.



Source-level waste segregation bins across academic blocks

Organic composting of biodegradable waste.

Composting and vermicomposting units

Vermicompost manure used for campus plants and green landscaping at K R Mangalam University, promoting circular waste management.

Solid trash of all types is produced by the university's resident halls, offices, labs, canteens, hospital, and other facilities. The university makes action to lessen the amount of solid trash produced. A microbial method is used to compost biodegradable trash. There is also a working biogas plant (Vermicompost Pit)

b. Liquid Waste

Waste water collection, recycling, and reuse

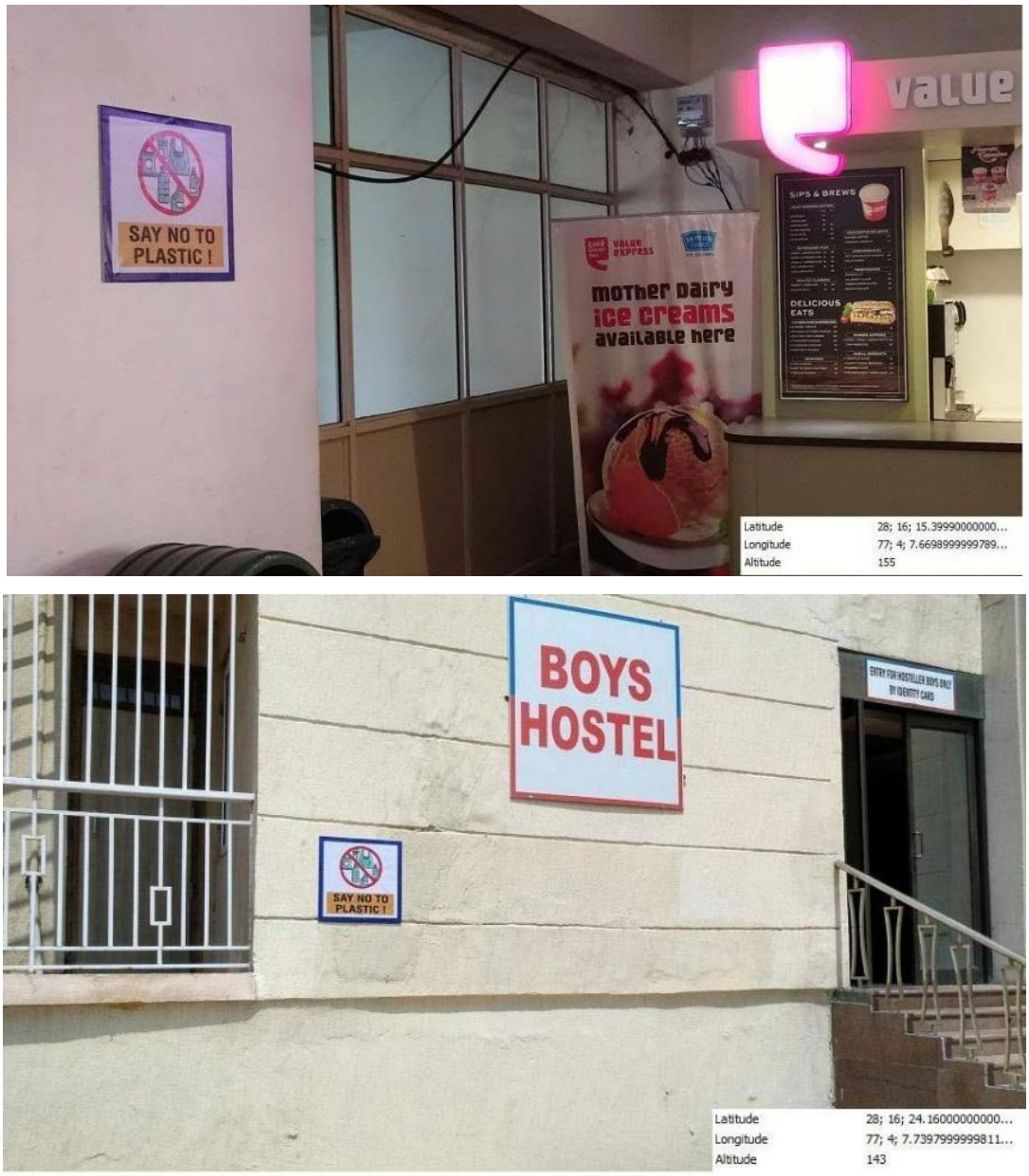
The university also collects wastewater that is processed in a 100KLD STP facility which is now increased o 300KLD. The STP's treated water is utilized for planting and irrigation. This procedure is still followed, and efforts are made to enhance waste water collection and treatment even further.

STP near D Block at K R Mangalam University enabling wastewater recycling for irrigation and green landscaping

12.2.5 Policy for minimisation of plastic use

The institution is committed to minimizing the use of plastic across all operations to reduce environmental impact and promote sustainability. Single-use plastics will be gradually phased out and replaced with reusable, recyclable, or biodegradable alternatives.

Sustainable Environment and Green Campus Policy



Plastic Ban signboards at K R Mangalam University spreading awareness on reducing single-use plastics and promoting sustainability.

SDG 12.2.6: Minimisation of Disposable Item Policy

In accordance with Sustainable Development Goal 12 – Responsible Consumption and Production, K.R. Mangalam University has implemented a comprehensive Disposable Item Minimisation Policy to significantly curtail the use of single-use and disposable materials throughout all levels of campus operations. This policy establishes a structured framework aimed at eliminating single-use plastics, reducing paper and packaging waste, and encouraging the use of reusable and biodegradable alternatives while promoting a circular economy approach. Through focused initiatives such as the installation of composting units, the execution of recycling programs, and the advocacy of digital alternatives to paper-based processes, the university has successfully achieved a significant reduction in the consumption of plastic bottles, disposable cups, and paper. Additionally, the policy highlights the importance of community engagement and awareness, ensuring that faculty, staff, and students are actively involved in sustainable consumption practices. By incorporating waste minimization principles into its procurement and operational systems, K.R. Mangalam University showcases its steadfast commitment to environmental sustainability, resource efficiency, and responsible campus management making tangible progress toward fulfilling SDG 12 and promoting a greener, more sustainable future.

Minimisation of Disposable Items Policy

Say No to Plastic' boards across K R Mangalam University promoting awareness on eliminating plastic use and fostering a green campus culture.

12.2.7 – Extension of Minimisation Policies to Outsourced Services

In accordance with the principles of Responsible Consumption and Production, the Minimization and Waste Management Policies are effectively applied to all outsourced services and partnerships, ensuring that sustainability practices are embedded at every level of operation and collaboration. Through clearly defined contractual clauses, agreement, sustainable measures are incorporated into service delivery areas such as waste management, agricultural sustainability, and environmental conservation. These initiatives highlight eco-friendly provisions in vendor agreements, encourage scientific waste management and recycling, and raise awareness among local farming communities regarding sustainable agricultural practices. Additionally, efforts are focused on reducing open field burning, decreasing chemical dependency, and enhancing soil and air quality. This comprehensive approach bolsters environmental accountability among external partners and cultivates a culture of sustainability throughout institutional operations. By extending minimization policies beyond campus boundaries, the initiative demonstrates a robust commitment to sustainable operations, community involvement, and the promotion of environmental stewardship.

Disposable Items Extensions to Services Policy

Key Initiatives and Collaborations

Agreement with Biotic Waste Solutions Limited:

K R Mangalam University has signed an agreement with Biotic Waste Solutions Limited to facilitate scientific waste collection, segregation, and disposal. This partnership guarantees adherence to the Bio-Medical Waste Management Rules (2016) and the Solid Waste Management Rules (2016). Through this collaboration, the university's standards for waste minimization and disposal are extended to external waste handlers, thereby promoting environmentally friendly waste processing and recycling.

Agreement for biomedical waste disposal

Mentioned below are the list of initiatives through which the University extends its minimisation and sustainability practices to outsourced services and external community stakeholders, thereby promoting responsible waste management and resource conservation beyond campus boundaries.

S N	Name of the activity	Organized by	Date	Link
01	Case Study - Management Strategies of Rice Crop Residues at Nearby Village of Sohna	School of Agricultural Science, KRMU	2022-24	Case Study Report
02	Case Study: Regulatory Barriers to the Acceptance of Bio-Pesticides among Farmers	School of Agricultural Science, KRMU	2023-24	Case Study Report 2
03	Inside the Design Studio: Architect's Office site Visit In collaboration with KEIC	School of Architecture and Design, KRMU	4 September 2023	Report
04	Workshop on Protected Cultivation of High-Value Horticultural Crops	School of Agricultural Science, KRMU	21 September 2023	Workshop Report
05	One Day Camp on the occasion of Swachhata Campaign 3.0	National Service Scheme	30th October 2023	Report Swachhta Camp
06	Workshop: Post-Harvest Technology at Shikohpur KVK	School of Agricultural Science, KRMU	20th November 2023	Report Workshop 2
07	Conference; Advanced Materials for Green Chemistry and Environmental Sustainability (AMGSE-2024)	School of Basic and Applied Sciences, KRMU	15-16 February 2024	Conference Report
08	Awareness session on Raising Awareness: Health Impact of Wastewater Utilization	NSS	8th April 2024	Report

Case Study - Management Strategies of Rice Crop Residues at Nearby Village of Sohna: The case study examines the environmental and agricultural challenges associated with the burning of rice residue in villages located near Sohna, Haryana. The study was conducted by the School of Agricultural Sciences (SOAS) at K.R. Mangalam University included awareness workshops, field demonstrations, and surveys of farmers. It revealed that stubble burning is a prevalent practice, primarily due to the limited time available between the rice harvest and the

sowing of wheat, high labor costs, and the absence of affordable machinery for residue management. Farmers received education on sustainable alternatives, which encompassed in-situ management techniques such as mulching, soil incorporation, and no-till farming, as well as ex-situ utilization methods like biochar production, composting, animal feed, and biomass energy generation. The project showcased an increase in awareness among farmers and a gradual transition towards environmentally friendly residue management practices. It highlighted the necessity of government support, training, subsidies, and technological advancements to render sustainable methods economically feasible. By minimizing open-field burning, these strategies contribute to enhanced soil health, reduced air pollution, and improved agricultural productivity. This initiative is in alignment with SDG 12 Responsible Consumption and Production, specifically metric 12.2.7, which advocates for the sustainable management and efficient utilization of natural resources. The project promotes the principles of a circular economy by transforming agricultural waste into valuable products, preserving soil fertility, decreasing greenhouse gas emissions, and encouraging responsible resource use in agriculture, thereby fostering a sustainable production-consumption cycle.

K R Mangalam University students interacting with farmers to gather data on sustainable farming and resource management practices

Farmers taking an oath against crop residue burning during K R MANGALAM UNIVERSITY's awareness and sustainability outreach programme

Case Study: Regulatory Barriers to the Acceptance of Bio-Pesticides among Farmers

The case study investigates the regulatory and practical obstacles that impede the adoption of bio-pesticides in the Gurgaon and Nuh districts of Haryana. Although bio-pesticides present an environmentally friendly alternative to chemical pesticides, their utilization remains limited due to various factors, including insufficient awareness, elevated costs, absence of subsidies, and inadequate market availability. Surveys indicated that the majority of farmers in Gurgaon continue to depend on chemical pesticides, while a portion in Nuh has started to implement bio-pesticides and integrated pest management (IPM) strategies. Extension initiatives such as expert consultations, field demonstrations, and awareness programs have notably enhanced farmers' understanding and adoption rates, resulting in a 15% increase in bio-pesticide usage and a decrease in chemical reliance from 25% to 16.7%. The results underscore the pressing necessity for policy reforms, enhanced accessibility, and governmental support to foster sustainable pest management. Streamlining regulations and ensuring local market availability can expedite the shift towards sustainable agriculture. This case study corresponds with Sustainable Development Goal 12, specifically metric 12.2.7, by advocating for the sustainable utilization of natural resources and promoting environmentally responsible agricultural inputs.

The adoption of bio-pesticides enhances resource efficiency, soil health, pollution mitigation, and safe food production, thereby encouraging sustainable consumption and production practices in accordance with global sustainability benchmarks.

Site Visit:

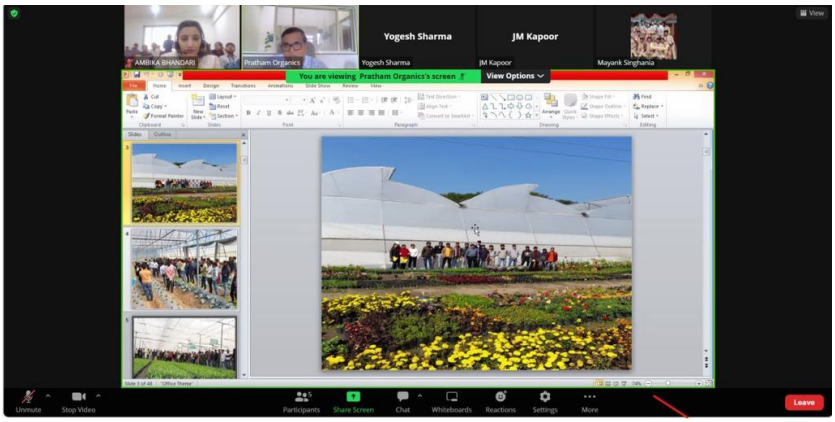
The School of Architecture and Design, in collaboration with KEIC, organized a site visit for 2nd-year B.ID and B.Sc. ID students to Pearl Sanduja Archovations, Sohna, Gurugram, on 14th September 2023. The visit aimed to provide practical exposure to professional architectural practices and office design. Students interacted with Ar. Pearl Sanduja, gaining insights into design processes, space planning, and project management. They observed real-time coordination among architects, designers, and clients, and learned about the integration of aesthetics and functionality in interior and exterior design. The hands-on experience of taking measurements and understanding circulation enhanced their design perspective. Overall, the visit bridged the gap between theory and practice, motivating students to approach real-world design challenges with creativity and confidence.

Faculty interaction with Ar. Pearl Sanduja on sustainable design and green architecture

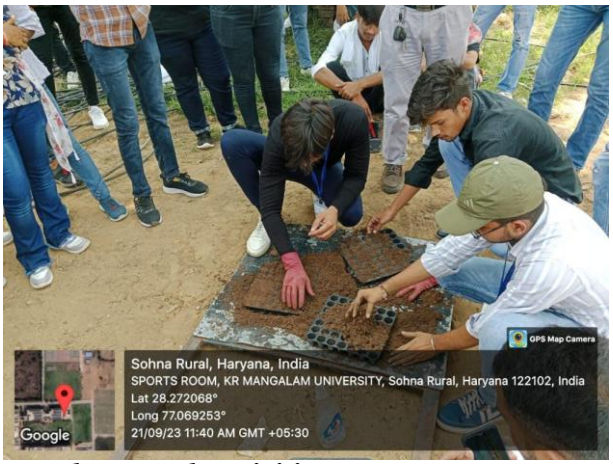
students taking field measurements during a practical site study on sustainable infrastructure

Protected Cultivation of High-Value Horticultural Crops as a Livelihood Opportunity in Urban Agriculture

The School of Agricultural Sciences (SOAS) at K.R. Mangalam University, in collaboration with KEIC, organized a workshop on "Protected Cultivation of High-Value Horticultural Crops as a Livelihood Opportunity in Urban Agriculture" on 21st September 2023. The session, led by Dr. V. S. Pal, Founder and CEO of Pratham Organics, aimed to introduce students to modern cultivation techniques such as climate-controlled environments, micro-irrigation, fertigation, and soilless farming. He emphasized the growing importance of urban agriculture in ensuring food security and sustainability. A practical demonstration, conducted by Dr. Ambika Bhandari at the university's agricultural farm, allowed students to practice the plug tray technique for seedling production using cocopeat and perlite. The workshop successfully combined theoretical learning and hands-on training, enhancing students' knowledge of protected cultivation, nursery management, and sustainable agricultural practices while motivating them to explore entrepreneurial opportunities in urban farming.



Dr. V. S. Pal guiding participants on sustainable practices for protecting high-value horticultural crops



students participating in sustainability and outreach activities

One Day Camp on the occasion of Swachhata Campaign 3.0

As part of the Swachhata Campaign 3.0 launched by the Government of India from 2nd to 31st October 2023, NSS K.R. Mangalam University, in collaboration with the Uboonto Foundation, Delhi, organized an expert session on 30th October 2023 in Lakhuwas village, Sohna, to promote cleanliness and waste recycling. The comprehensive event included various activities such as a cleanliness drive at the Government School, a rally within the village, an expert-led awareness session on the reuse of waste materials, and a pledge ceremony involving Government School students. During the session, Ms. Priya from the Uboonto Foundation demonstrated creative ways to recycle household waste into usable items such as planters, decorative materials, and storage containers, encouraging sustainable living practices among villagers. The program concluded with a pledge ceremony, where students and villagers committed to maintaining cleanliness, segregating waste at source, and promoting the reuse and recycling of materials in support of the Swachh Bharat Mission.

NSS volunteers from K R Mangalam University spreading awareness during the environmental sustainability rally

NSS volunteers and school students taking a pledge for environmental protection and sustainability.

Workshop on Post-Harvest Technology at Krishi Vigyan Kendra (KVK)

The School of Agricultural Sciences (SOAS) in collaboration with NSS organized a Workshop on Post-Harvest Technology at Krishi Vigyan Kendra (KVK), Shikohpur on 20th November 2023, under the guidance of Dr. J.S. Yadav. The session aimed to raise awareness among students and villagers about scientific post-harvest management and value addition of fruits and vegetables. Dr. Kavita Bisht demonstrated practical techniques to preserve perishable produce, including processing of Indian gooseberry (amla) for extended shelf life. Experts also highlighted the significance of millets and their applications in bakery products. Participants gained hands-on experience in handling, processing, and preservation methods while understanding causes of post-harvest losses and the benefits of processing in improving quality, food safety, and farmers' income. The workshop enhanced participants' knowledge of sustainable agricultural practices and encouraged continued community-based learning and entrepreneurship in post-harvest technology.

Dr. Bharat explaining the importance of post-harvest practices for sustainable agriculture and reduced food loss

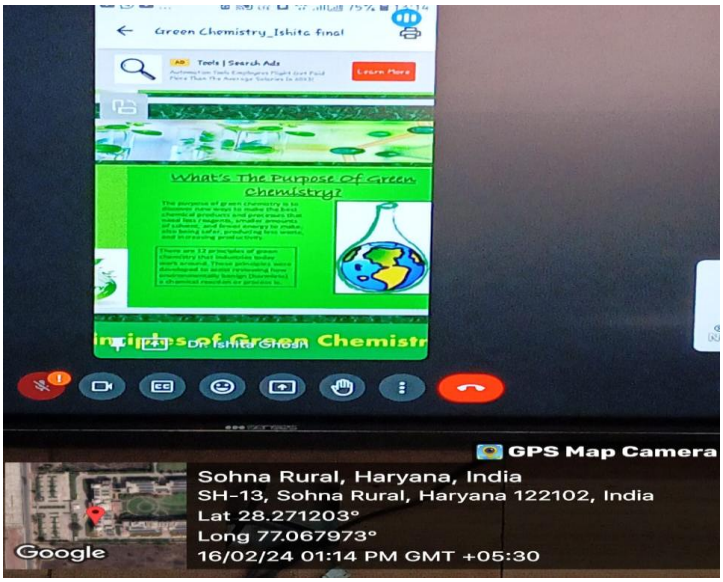
K R Mangalam University students practising post-harvest techniques to reduce microbial risks and ensure healthy food consumption.

Conference: Advanced Materials for Green Chemistry and Environmental Sustainability (AMGSE-2024)

The School of Applied Sciences, K.R. Mangalam University, in collaboration with the International Association of Advanced Materials (IAAM), Sweden, and the Indian Science Congress Association (ISCA), Rohtak Chapter, organized a two-day International Conference on "Advanced Materials for Green Chemistry and Environmental Sustainability (AMGSE-2024)" on 15–16 February 2024. The conference aimed to explore innovative solutions for environmental challenges and promote sustainable development through green chemistry and advanced materials. Distinguished speakers, including Dr. Sushil Kumar (CSIR-NPL), Prof. R.K. Sinha (VC, K R Mangalam University), Prof. R.K. Sharma (Delhi University), and international experts from Portugal, Canada, Finland, and South Africa, delivered insightful lectures. Over 120 participants, including faculty, research scholars, and students, presented 60 oral and 45 poster papers highlighting advancements in green technology, nanomaterials, and sustainability. The event concluded with a valedictory session honoring the best presentations and expressing gratitude to all collaborators and organizers. The conference was a resounding success, fostering innovation, knowledge exchange, and global collaboration in green chemistry for a sustainable future.

Delegates and convenors releasing the abstract book during the International Conference on Advanced Materials for Green Chemistry and Environmental Sustainability (AMGSE-2024) at K R Mangalam University

Dr. Avni Khatkar delivering an invited lecture on Microwave Metrology at K R Mangalam University during AMGSE-2024



Online paper presentations by participants during Day 2 of the AMGSE-2024 Conference at K R Mangalam University

Awareness session on "Raising Awareness: Health Impact of Wastewater Utilization"

The NSS unit of K.R. Mangalam University organized an awareness session on "Raising Awareness: Health Impact of Wastewater Utilization" on 8th April 2024 at Government Senior Secondary School, Daulah, coordinated by Dr. Meena Kumari (NSS Member) and Dr. Neeraj Kumari (NSS Coordinator). The session, attended by 32 school students and 34 NSS volunteers, aimed to educate participants on the health risks of using untreated wastewater and promote safe water management practices. The event began with an introduction by Dr. Neeraj, followed by a Nukkad Natak (street play) depicting a community's struggle with water scarcity and the resulting health hazards from using contaminated water, including diseases like cholera, typhoid, and gastroenteritis. Through the skit and an interactive discussion, students learned about the importance of clean water, sanitation, and simple purification methods. The session received positive feedback for creatively spreading awareness, effectively enhancing students' understanding of wastewater's impact on health and encouraging sustainable practices to safeguard public well-being.

sustainability awareness programme

NSS volunteers from K R Mangalam University performing a skit on wastewater management and environmental awareness

12.2.8 Extension of Minimisation Policies to outsourced Suppliers

K.R. Mangalam University has broadened its Minimisation and Sustainability Policies to include outsourced suppliers, contractors, and procurement agencies. This initiative guarantees that sustainability principles are integrated throughout the entire supply chain—from material sourcing and packaging to waste management and oversight of the product lifecycle. The university's dedication has led to enhanced vendor compliance with green policies, a decrease in environmental impact through sustainable sourcing and waste reduction, improved accountability among suppliers, and the establishment of long-term sustainability partnerships. Additionally, sustainability metrics have been integrated into procurement and contract management frameworks. By implementing sustainable procurement guidelines, forming strategic alliances, and performing environmental audits, K.R. Mangalam University ensures that its Minimization Policies are effectively executed for all external partners, thus reinforcing operational sustainability and making a significant contribution toward achieving SDG 12 – Responsible Consumption and Production.

Sustainable Environment and Green Campus Policy

12.3.1– Waste Tracking (Measurement of Waste Generated & Recycled)

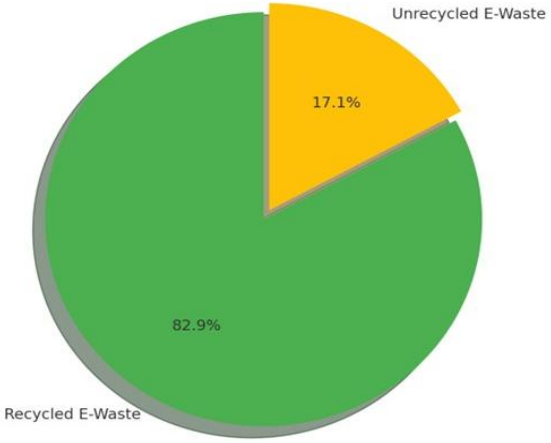
In alignment with Sustainable Development Goal (SDG) 12 – Responsible Consumption and Production, all types of waste generated on campus are systematically measured, monitored, and managed to ensure sustainable operations and environmental compliance. Through the Green Audit 2023 conducted by M/s Samarth Management Pvt. Ltd., detailed quantitative and

qualitative data on waste generation, segregation, treatment, and recycling were obtained. The university minimizes landfill dependency by promoting recycling, composting, and responsible disposal through authorized agencies in compliance with national environmental regulations. Multiple waste streams—biodegradable, non-biodegradable, liquid, biomedical, e-waste, and hazardous—are segregated at the source using a three-bin system placed across academic and residential areas. Waste quantities are periodically reviewed by the Environment and Sustainability Committee (ESC) and NSS unit through monthly monitoring reports that track generation, recycling rates, and compliance of outsourced handlers, as documented in the Green Audit Report (2023). This structured system has led to significant achievements: 60% of biodegradable waste is composted annually, 100% of e-waste and biomedical waste is processed by authorized vendors, and 50,000 liters of wastewater are recycled daily through the STP. The campus has also achieved plastic-free status while promoting zero-waste initiatives through student-led campaigns. Collectively, these actions establish a robust and measurable framework for sustainable waste management, reinforcing commitment to efficient resource utilization, regulatory compliance, and the creation of a cleaner, greener university environment.

Recycling of E-Waste:

K.R. Mangalam University has established a thorough E-Waste Management System to ensure the environmentally sound disposal of discarded electronic devices. In the academic year 2023–24, the university produced approximately 4,030 kg of e-waste, with 83% being scientifically recycled through its authorized partner — M/s GreenTech Recyclers Pvt. Ltd. Gurugram — while 17% was reused or refurbished for internal purposes. This initiative features clearly marked collection bins, a central storage facility that complies with CPCB standards, and regular quarterly audits conducted by the Facilities Department and the IQAC Green Committee. Awareness initiatives, including workshops on “Responsible Digital Consumption” and e-waste collection drives, have enhanced community involvement. These actions have diverted over 3 tonnes of e-waste from landfills and avoided around 9 tonnes of CO_2-equivalent emissions, in line with SDG 12 – Responsible Consumption and Production, and furthering K R Mangalam University goal of a sustainable, technology-oriented campus.

Annual Audit Report of E-Waste Management

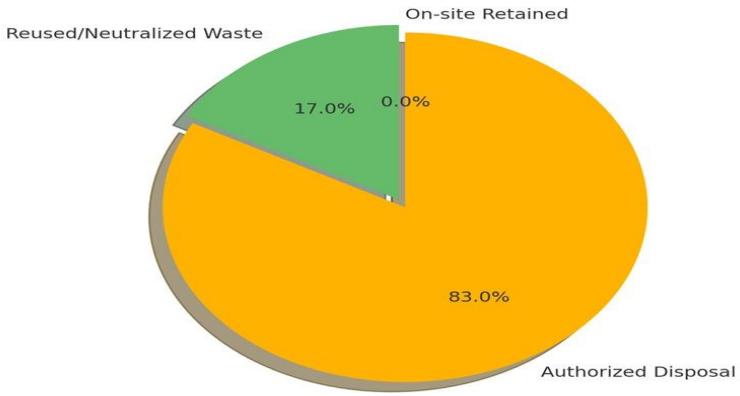


Pie chart showing the proportion of recycled and unrecycled e-waste, indicating that 82.9% of e-waste is recycled, while 17.1% remains unrecycled, highlighting the growing need for improved e-waste management practices.

Recycling of Hazardous Waste

During the academic year 2023–24, approximately 600 kg of hazardous waste was produced, which included chemical residues, biomedical waste, used oils, and contaminated packaging. About 83% of this waste was disposed of safely through authorized recyclers, while the remaining 17% was either neutralized or reused within laboratories under controlled conditions. Regular monitoring, quarterly audits, and strict adherence to the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 ensured complete regulatory compliance. Training workshops, awareness campaigns, and emergency drills improved safety practices among both staff and students. This initiative led to zero spill incidents, a 12% reduction in waste generation, and enhanced environmental safety, demonstrating the institution's dedication to sustainable and responsible waste management.

Annual Audit Report of Hazardous Waste Management

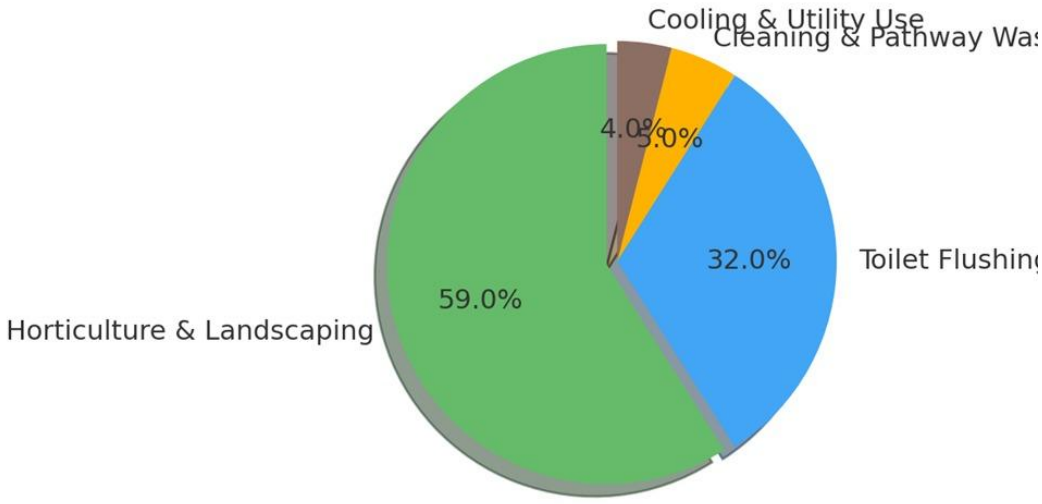


Pie chart illustrating the waste management distribution, showing that 83% of waste is disposed of through authorized channels, 17% is reused or neutralized, and 0% is retained on-site, reflecting effective waste handling and environmental compliance practices.

Recycling of Liquid Waste

The effective management of liquid waste throughout the academic year 2023–24 showcased a robust commitment to sustainability via efficient practices in wastewater treatment and reuse. The university's Sewage Treatment Plant (STP), utilizing Moving Bed Biofilm Reactor (MBBR) technology, achieved an impressive average efficiency of 91.3%, processing around 81,600 KL of wastewater and reusing approximately 91% of the treated water for purposes such as horticulture, flushing, cleaning, and utility needs. These initiatives led to a 30% reduction in borewell water extraction, conserving nearly 45,000 KL of freshwater each year. Ongoing monitoring through flow meters and pH sensors, coupled with awareness programs like water conservation campaigns and student workshops, further promoted sustainable water usage. In summary, these efforts significantly diminished the campus water footprint and directly supported SDG 12 – Responsible Consumption and Production, fostering responsible resource management and circular water practices.

Annual Audit Report of Liquid Waste Management



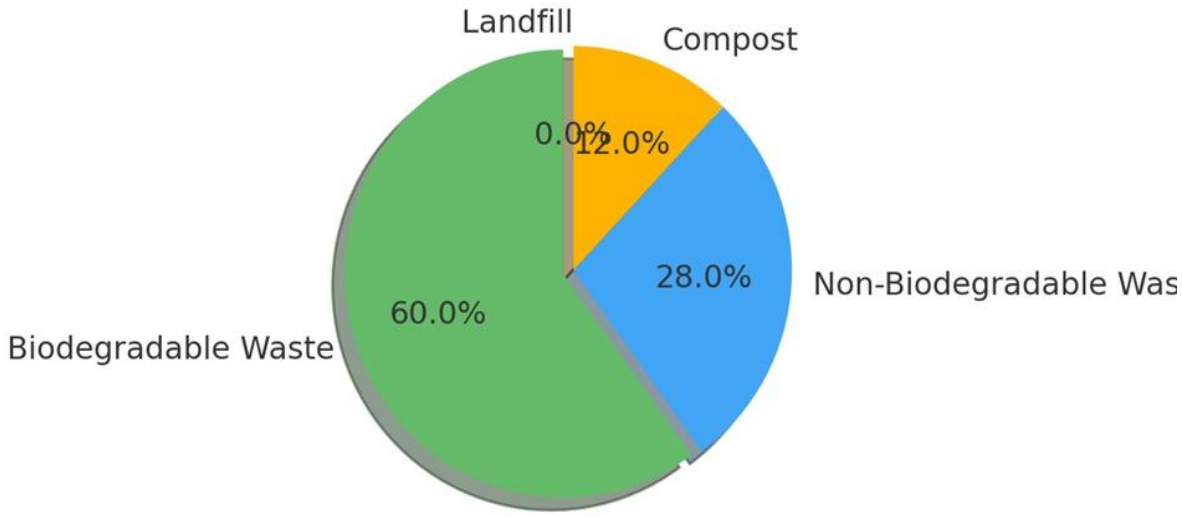
Pie chart depicting the reuse of treated wastewater, showing that 59% is utilized for horticulture and landscaping, 32% for toilet flushing, 5% for cleaning and pathway washing, and 4% for cooling and utility use, emphasizing sustainable water management practices.

Recycling of Solid Waste

Throughout the academic year 2023–24, approximately 84 tonnes of solid waste were processed via an integrated approach that included segregation, composting, recycling, and biogas production. Roughly 60% of the waste was biodegradable, resulting in the creation of 12 tonnes of nutrient-dense compost and biogas utilized for campus operations, while 28% of the non-biodegradable waste was directed to certified recyclers. The introduction of a two-bin

segregation system, consistent waste audits, and educational initiatives such as Solid Waste Awareness Week and No Plastic Day contributed to achieving 100% source segregation and eliminating waste sent to landfills. These initiatives collectively led to a reduction of nearly 70 tonnes of CO_2-equivalent in the university's carbon emissions and fostered a culture of responsible waste management.

Annual Audit Report of Solid Waste Management

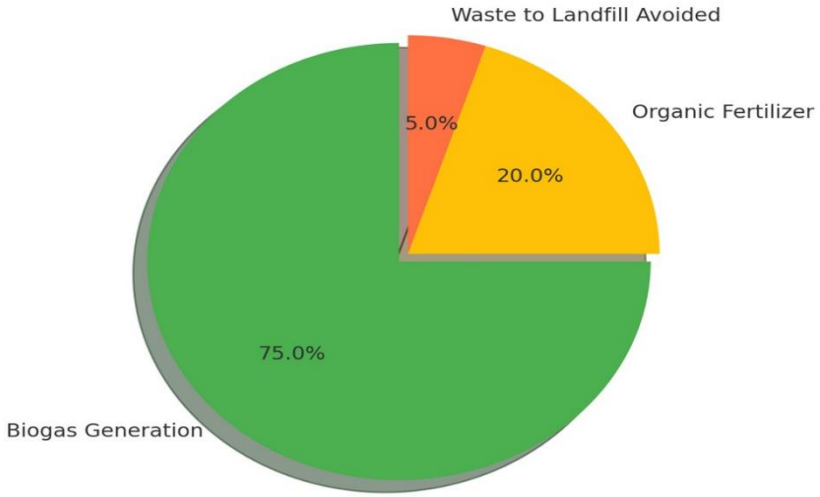


Pie chart representing the solid waste composition, indicating that 60% of waste is biodegradable, 28% is non-biodegradable, 12% is converted into compost, and 0% is sent to landfill, highlighting effective waste segregation and composting practices.

Recycling of Food Waste:

An integrated system for the utilization of food waste via a biogas plant effectively transforms organic waste from the university hostel mess into renewable energy and organic fertilizer. Approximately 3.8 tons of food waste are processed each year, producing 5–7 m^3 of biogas daily and 220–300 kg of fertilizer monthly. The biogas generated is utilized for cooking and renewable energy demonstrations, substituting approximately 5–7 kg of LPG each day and leading to annual savings of ₹2–2.5 lakh. This system not only diverts waste from landfills but also achieves a reduction in CO_2 emissions of 5–8 tons annually, thereby fostering a circular economy.

Annual Audit Report of Food Waste Management



Pie chart illustrating waste-to-energy and resource recovery, showing that 75% of waste contributes to biogas generation, 20% is converted into organic fertilizer, and 5% of waste to landfill is avoided, promoting sustainable waste management practices

12.3.2 Proportion of Waste Recycled

K.R. Mangalam University, Gurugram, demonstrates a strong institutional commitment to sustainable campus operations and responsible waste management. Guided by the University's Sustainable Environment and Green Campus Policy, the University implements an integrated system for waste segregation, recycling, composting, and safe disposal in compliance with Municipal Solid Waste Management Rules (2016), Haryana State Pollution Control Board (HSPCB) Guidelines and annual Green Audit and Environmental Audits by *M/s Samarth Management Private Limited.*

All waste streams from academic and administrative blocks, hostels, laboratories, workshops, cafeterias, the health centre, and the agricultural greenhouse are supervised by the Administrative Office.

To ensure transparent, safe, and environmentally compliant disposal of waste, K.R. Mangalam University has also entered into formal Memoranda of Understanding (MoUs) with certified agencies and has vendor tie-ups for disposal and recycling. These partnerships enable systematic recycling, reuse, and safe disposal of recyclable, hazardous, and e-waste materials generated on campus, strengthening the University's transition toward a Zero-Waste Campus Model. The University mandates 100% segregation of waste at source across all academic and residential buildings, supported by on-site composting pits and biogas facilities for organic waste. Recyclable materials are systematically collected and transferred only to authorized

recyclers, with proceeds reinvested into campus sustainability initiatives. Meanwhile, non-recyclable residues are securely stored and handed over to municipal authorities on a scheduled basis. The compost generated from cafeteria food waste is utilized in campus landscaping and green-belt maintenance, demonstrating a closed-loop waste management approach. The framework aligns with the University's long-term zero-waste vision, with a targeted 80% reduction in landfill-directed waste by 2027.

Sustainable Environment and Green Campus Policy

- Periodic **Environmental, Green, and Energy Audits**

Environmental Audit Report

https://www.krmangalam.edu.in/pdfs/sustainable/environmental-audit-K R Mangalam University-23-05-2025.pdf

Energy Audit Report:

https://www.krmangalam.edu.in/pdfs/sustainable/energy-audit-K R Mangalam University-23-05-2025.pdf

Green Audit Report:

https://www.krmangalam.edu.in/pdfs/sustainable/green-audit-K R Mangalam University-23-05-2025.pdf

- Vendor tie-ups with authorised contractors for disposal and recycling
- Link for Waste disposal MoU: Hazardous waste & scrap disposal MoU.pdf

Waste Segregation and Recycling Infrastructure

K R Mangalam University has adopted colour-coded segregation bins across all blocks:

- **Green** – Biodegradable waste
- **Blue** – Recyclable dry waste
- **Yellow**– Non-Biodegradable / Hazardous Waste

Segregation at source is ensured through regular training of housekeeping staff, students, and faculty. The University has established:

- **Composting pit and vermicomposting unit** for organic waste
- **Biogas plant** for food waste from hostels and cafeteria
- **Central waste storage zone** for temporary segregation before collection by authorized vendors

Type-wise Waste Management

a. Solid Waste

- Biodegradable waste (food waste, leaves) is processed into organic compost and used for landscaping.
- Paper and cardboard waste are sold to authorised scrap vendors.
- Plastic and metal waste are collected by contracted recyclers.

Segregation bins across K R Mangalam University academic blocks ensuring source-level waste separation and sustainable campus practices

Composting and vermicomposting units at K R Mangalam University converting organic waste into eco-friendly manure for campus greens

Vermicompost manure reused for campus plants and landscaping at K R Mangalam University, supporting sustainable waste-to-resource practices

b. Liquid Waste

- A Sewage Treatment Plant (STP) of 100,000 L/day capacity treats domestic wastewater.
- Treated water is reused for irrigation and gardening.
- Low-flush cisterns and aerators are installed to reduce water use.

Layout of K R Mangalam University's Sewage Treatment Plant illustrating wastewater recycling and reuse system

100,000 L/day STP at K R Mangalam University treating wastewater for reuse in irrigation and green landscaping

Reused treated water from K R Mangalam University's STP for plantation and campus landscaping

c. E-Waste

- Obsolete computers, printers, batteries, and peripherals are handed to CPCB-approved e-waste recyclers.
- The NSS Unit organises periodic collection drives in coordination with the Admin Office.
- Link for Waste disposal MoU: Hazardous waste & scrap disposal MoU.pdf

d. Hazardous Waste

- Waste oil from DG sets (≈ 275 L/year) is stored in leak-proof containers and disposed of through HSPCB-approved vendors.
- Lead batteries and chemical residues are disposed of following the University's Standard Operating Procedure for Hazardous Waste.
- Hazardous waste & scrap disposal MoU.pdf

Table 1: Type of Waste in the University

Ser	Type/ Name of waste material	Approx. Qty per day	Method of Disposable
(a)	Paper Glass/ Paper Plates/ papers	02 Kg	Handed over to Hired contractor
(b)	Plastic spoons/Polythene bags/ plastic bottles	1.5 Kg	Handed over to Hired contractor
(c)	Waste food	10 Ltr	Handed over to Hired contractor
(d)	Grass/ Tree leaves	50 Kg	Disposed in field earmarked
(e)	News papers	500 Gm	Sold to scrap vendors
(f)	Card Boards	04 Kg	Sold to scrap vendors
(g)	Papers/Projects	2.5 Kgs	Sold to scrap vendors
(h)	Empty plastic canes/ drums/ buckets etc	250 Gm	Sold to scrap vendors

Table 2: Details of Waste Generated in the University

Waste Stream	Total Generated	% Recycled	Recycled Amount	Source
Solid Waste	84,000 kg (84 MT)	60% biodegradable + 28% recycled non-biodegradable	0.60×84 + 0.28×84 = 50.4 MT	"84 tonnes… 60% composted… 28% recycled"
E-Waste	4,030 kg (4.03 MT)	83%	3.35 MT	"4,030 kg… 83% recycled"
Hazardous Waste	600 kg (0.6 MT)	83%	0.498 MT	"600 kg… 83% disposed through authorized recyclers"
Food Waste	3.8 MT	~100% biogas/compost	3.8 MT	"3.8 tons… processed each year"
Total Waste	≈ 92.43 MT		≈ 58.05 MT	

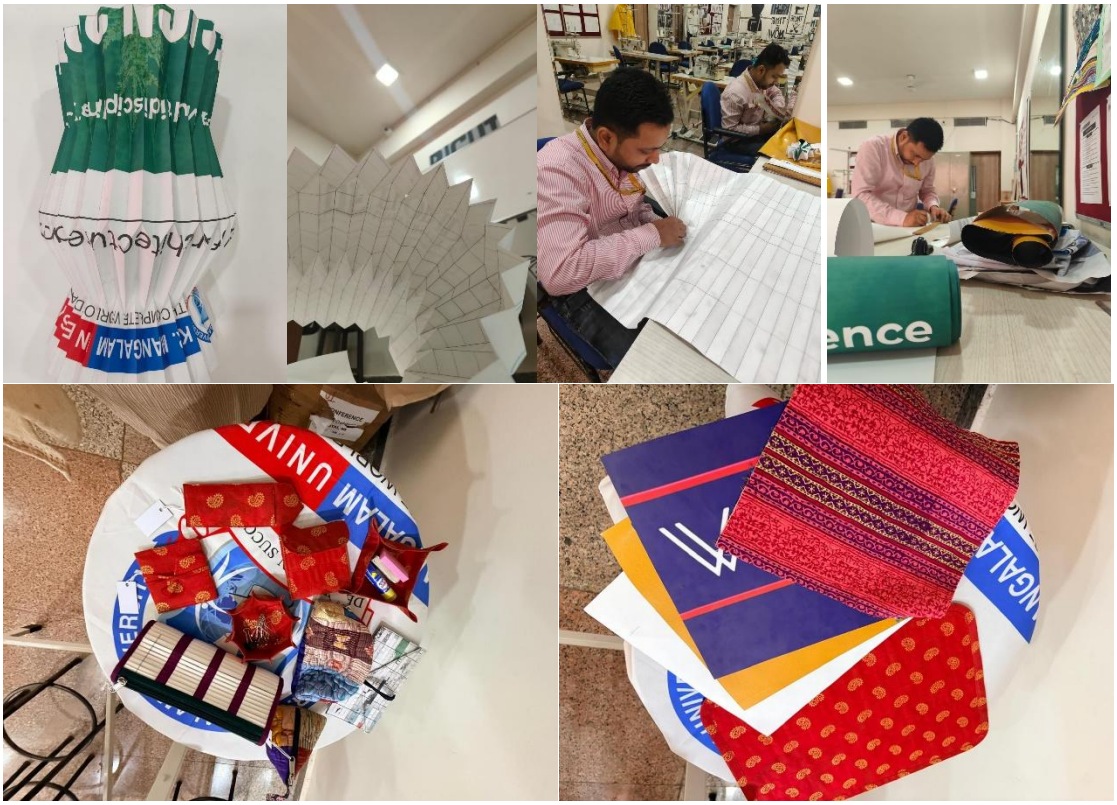
Table 3: Details of recycling proportion of waste generated in the university

Parameter	Description	Unit	Value (2024)
A. Total Waste Generated	Total solid + food + hazardous + e-waste generated on campus	Metric tons/year	≈ 92.43 MT
B. Waste Recycled	Total recycled/composted/biogas-processed waste	Metric tons/year	≈ 58.05 MT
C. Waste Sent to Landfill	Non-recyclable waste handed to municipal authorities/authorized handlers	Metric tons/year	≈ 34.38 MT
Recycling Proportion (%)	(B ÷ A) × 100	%	≈ 62.8%

Assignments related to promote waste recycle consciousness

Best Out of Waste Making: The assignment was given to explain green marketing and packaging in course Marketing Management. School of Management and Commerce plan to take this initiative further with the support of Indian Institute of Packaging.

K R Mangalam University students displaying innovative eco-friendly packaging materials made from recycled and biodegradable materials



Creative reuse initiative showcasing eco-friendly crafts made from recycled university flex banners and waste materials, promoting sustainability through upcycling and innovative design practices at K.R. Mangalam University

Upcycling project at K R Mangalam University turning non-recyclable materials into functional products, promoting resource efficiency and green skill development.

Demonstrating a commitment to environmental sustainability and innovation, this collection represents the successful reuse of non-recyclable flex banners. By skillfully converting waste into high-utility items such as table placemats, personal pouches, and decorative lighting components, the project directly addresses the challenge of plastic waste management. This endeavor serves as a model for institutional environmental policy and contributes tangible evidence to our focus on Green Campus initiatives and zero-waste principles.

Fashion Design students at K R Mangalam University showcasing wearable outfits crafted from recycled newspapers, exemplifying sustainable fashion.

Eco-friendly campus practices at K R Mangalam University promoting reuse, waste reduction, and sustainability through handmade lanyards, refill stations, and green gifting

Sustainability in Action: Integrating Eco-Conscious Practices in Campus Events. Every detail—from reusable handmade lanyards and plastic-free ID badges to minimal printing and green gifting—reflects an eco-conscious approach. Participants are encouraged to refill bottles instead of using disposables, reinforcing the culture of reuse and waste reduction. Living plants are offered as symbolic green gifts, representing growth, renewal, and the university's dedication to sustainable living. These collective efforts demonstrate how thoughtful design and everyday choices can create meaningful impact toward a greener, more responsible campus.

Awareness and Capacity-Building Activities

Sr. No	Title	Category	Date	Organiser	Report Link
1	Awareness session on Raising Awareness: Health Impact of Wastewater Utilization	Awarness Session	4/8/2024	NSS	Report
2	Workshop on Post harvest technology at Shikopur KVK	Extention activity	11/20/2023	SOAS & NSS	Workshop Report

3	Adinath Recyclotrix Pvt Ltd	MOU	24-08-2023	K R Mangalam University	Agreement
4	BIOTIC WASTE LIMITED	MOU	15-05-2024	K R Mangalam University	MoU
5	"Workshop on protected cultivation of high value horticultural crops as a livelihood opportunity in urban agriculture (with KEIC)"	Workshop	21-09-2023	SOAS KEIC	Workshop Report 2
6	International Conference on Advanced Materials for Green Chemistry and Sustainable, Environment	Conference	15-2-2024 and 16-02-2024	SBAS	Conference Report
7	Management strategies of rice crop residues at nearby vilage farmers of Sohna city and retcify the effect on germination of next crop	Case Study	14-10-23	SOAS	Report-Case Study

K.R. Mangalam University maintains an integrated and accountable system for managing waste generated across the campus. The processes of segregation, recycling, composting, and authorized disposal are implemented in accordance with statutory environmental regulations. The operation of the sewage treatment plant, the use of colour-coded bins, and the presence of composting and biogas facilities ensure effective utilization of degradable waste and reduction in landfill disposal. Formal agreements with certified agencies for the collection of recyclable, electronic, and hazardous waste strengthen compliance and transparency in waste management practices.

Periodic environmental, green, and energy audits confirm the efficiency of these systems and support continuous improvement in sustainable operations. The University remains committed to minimizing its environmental footprint and progressing towards a zero-waste and resource-efficient campus

12.4 Publication of a sustainability report

K.R. Mangalam University's mission of nurturing global citizens aligns with the United Nations Sustainable Development Goals via integrating several sustainability themes across academics, operations, and community outreach. Circular economy, ethical sourcing, and value addition aspects of SDG 12 responsible consumption and production0 are included directly in the academic and are addressed within the five undergraduate programs mentioned above. Several sustainability facets, including health, environment, gender, food security, and climate, are addressed in the undergraduate in addition. With diverse disciplines, students encounter real sustainability challenges via interdisciplinary, project-based learning. Moreover, equipped with action-oriented skills and knowledge, value-added courses offered on climate and the environment, health, sustainability and green innovation, food, and gender were identified as essential for green industry jobs and global citizenship.

Between 2014 and 2024, the University produced 1,042 Scopus-indexed publications, of which 152 directly align with SDG 12, addressing topics such as sustainable supply chains, waste valorization, circular economy models, clean technology, and eco-innovation.

- Cite Score (2024): 69.2 – reflecting high academic impact
- Field-Weighted Citation Impact (FWCI 2024): 3.21 – over three times the global average

These achievements highlight K R Mangalam University's interdisciplinary approach, linking environmental science, management, engineering, and design to advance sustainable production systems and resource efficiency for a circular and inclusive economy.

Most of these ambitions are met through available energy conservation measures like LED retrofitting, BLDC fans, motion-sensor lighting, and solar-powered streetlights. K R Mangalam University's 310 kW rooftop solar plant approximately offsets 35% of the University's total CT electricity consumption. A 300 KLD sewage treatment plant and 17 rainwater harvesting structures ensure that 91% of treated wastewater is reused for flushing and horticulture, thus reducing dependence on freshwater resources. Waste management is based on an integrated policy to reduce, reuse and recycle solid and liquid waste. A three-bin system segregates solid waste at source, and the compost is done on campus, with biogas plants processing

approximately 3.8 tonnes of food waste annually to generate clean energy and organic manure. Liquid waste from hostels and laboratories is treated by the STP, and most of the treated water reused for irrigation and sanitation E-waste, hazardous and biomedical waste managed follows a scientific process that meets the national legal requirements regarding environmental safety. Certified recyclers are employed in partnerships that ensure the collection and safe disposal of electronic items, lab chemicals, and waste oil. Annual audits have achieved stunning milestones, such as 83% e-waste recycling, 60% composting of solid waste, and 91% water reuse, thereby reducing the carbon footprint by more than 70 tons of CO2and saving around ₹2.5 lakh in energy costs annually. K R Mangalam University's NSS Unit and Environment Club lead many Swachhata Pakhwada campaigns, Zero-Waste Drives, and sustainability workshops involving student capacity building and awareness drives. These efforts inspire a culture of responsibility and behavioral adaptation among students and staff. The University also participates in community outreach involving parental environmental education on waste segregation, composting, and water conservation. Sustainability is also universally promoted through inter-school synergy and partnership programmes to eliminate environmental camps.

K.R. Mangalam University demonstrates institutional leadership in sustainable education through its structured policies, innovative academic practices, and strong community partnerships. Working efficiently together, renewable energy, waste reduction, ethical sourcing, and eco-literacy turn sustainability from policy into practice, upholding the objectives of SDG 12 to develop a cleaner, greener, and more responsible future.

KR Mangalam University Sustainability Report 2023-24