KALASALINGAM
ACADEMY OF RESEARCH AND EDUCATION
(DEEMED TO BE UNIVERSITY)

Under sec. 3 of UGC Act 1956. Accredited by NAAC with "A++" Grade

THE - Impact Rankings 2026

SDG 14: Life below Water

Annual Report – 2023 to 2024

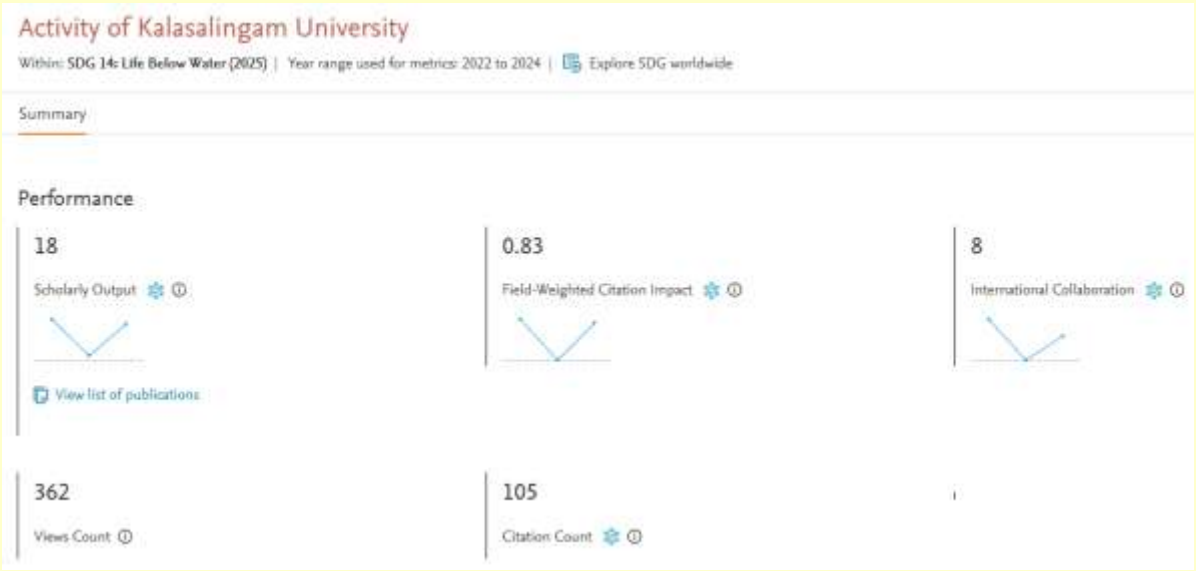
SDG 14 focuses on conserving and sustainably using the oceans, seas, and marine resources for long-term environmental stability and human well-being. Oceans play a vital role in supporting global ecosystems, regulating climate, providing livelihoods, and sustaining biodiversity. However, marine environments are increasingly threatened by pollution, overfishing, habitat destruction, coastal erosion, and the impacts of climate change.

This goal emphasizes the reduction of marine pollution, protection of coastal and marine ecosystems, strengthening of scientific research, and improvement of sustainable fisheries management. It also promotes education, awareness, and international cooperation to safeguard marine biodiversity and ensure the responsible use of ocean-based resources.

Universities contribute significantly to SDG 14 through marine and environmental research, pollution monitoring, sustainability education, and community engagement initiatives. Academic institutions support scientific studies on water quality, aquatic ecosystems, climate impacts, plastic waste reduction, and conservation practices. They also promote environmental stewardship by organizing awareness campaigns, clean-up drives, and training programs for students and local communities.

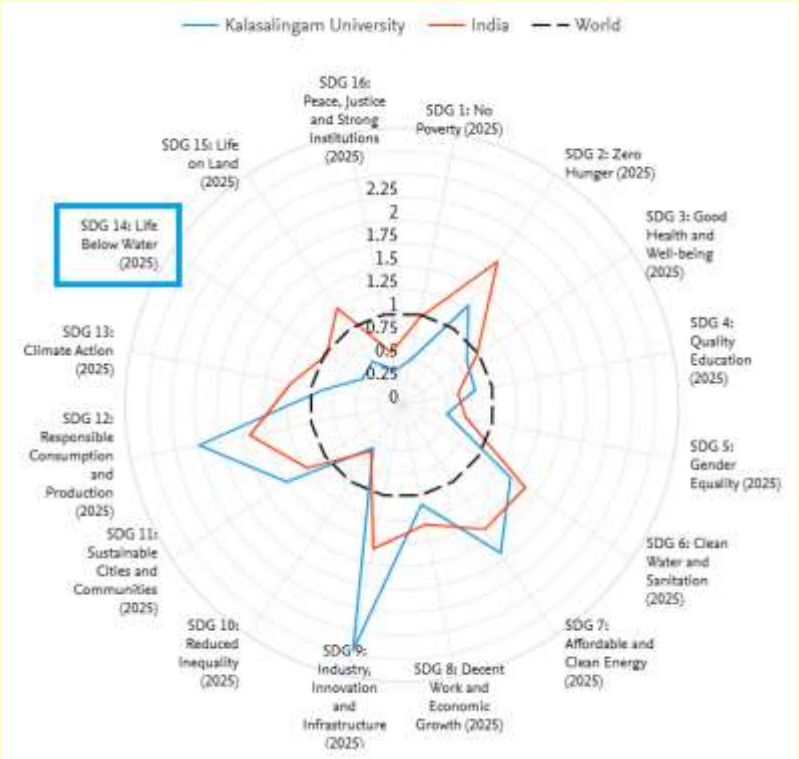
By integrating sustainable practices, promoting responsible resource use, and fostering innovation in environmental protection, higher education institutions strengthen global efforts to protect marine life and preserve aquatic ecosystems for future generations.

SDG 14: Research Metrics (SciVal)



Relative Activity

The Relative Activity Index is defined as the share of an Institution's Scholarly Output in a SDG relative to the worldwide share of Scholarly Output in that same SDG.



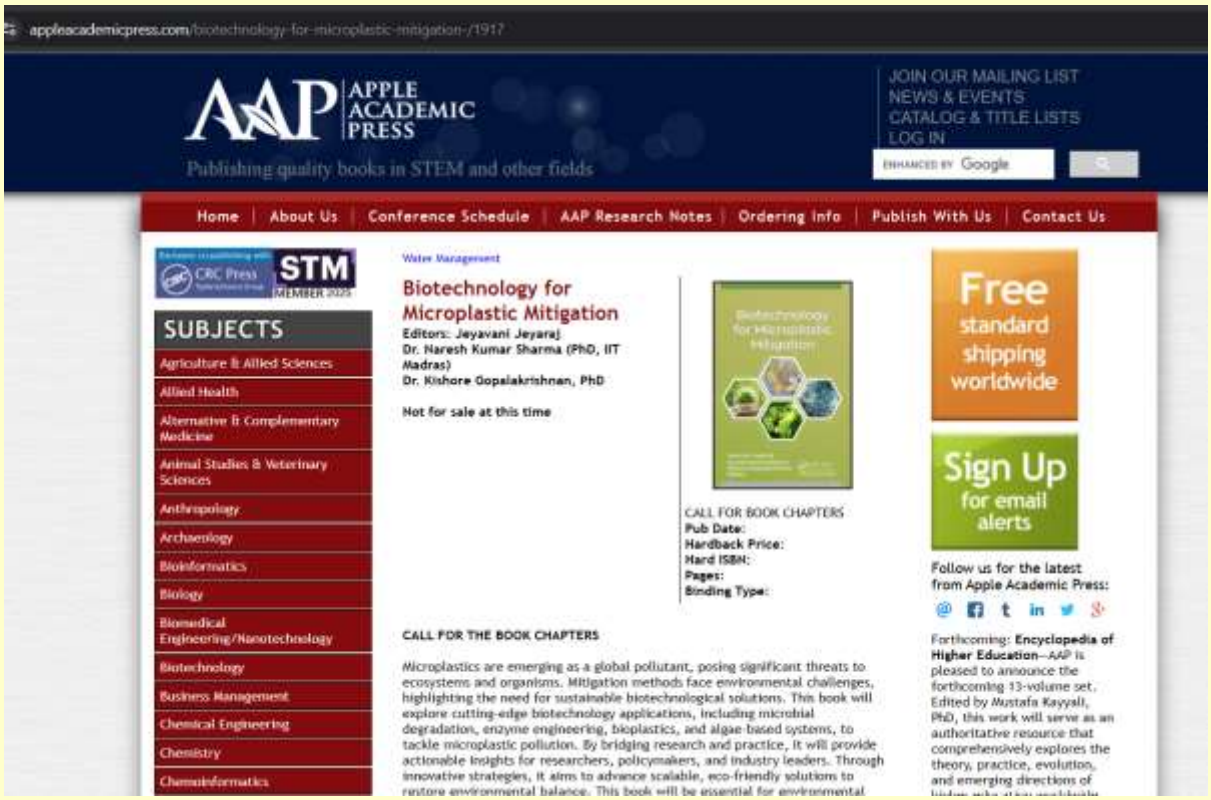
1. Sustainable Water Management and Conservation Practices

Kalasalingam Academy of Research and Education (KARE) continues to strengthen its commitment to Sustainable Development Goal 14—*Life Below Water*—by implementing a range of policies and practices designed to conserve and protect water resources within and beyond the campus. The KARE campus spans 163 acres and receives approximately 5.4 lakh m^3 of annual rainfall, which significantly contributes to groundwater recharge. The institution has implemented rainwater harvesting and groundwater recharge systems to ensure efficient use of this natural resource.

To minimize water wastage, KARE has replaced conventional water fixtures with water-efficient appliances such as aerated taps, dual-flush toilets, and flow-controlled valves. These upgrades have substantially reduced per capita water consumption on campus. In the hostels and central laundry facilities, automated washing systems with optimized water cycles are employed to minimize water use while ensuring hygiene. The hostel kitchens utilize steam boilers to reduce both water and energy wastage, reinforcing a culture of sustainable resource management.

S.No	Faculty Name	Faculty ID	Category	Project title
1	Dr.Srinithi	JSRCHE	Hazardous Waste	Hazardous Chemical Tracking and Alert system for safe Laboratory Practices
				Connecting Households With Hazardous waste Experts an mobile App:EcoDispose Hub
				Eco-smart system and sustainable approaches to hazardous in bio-medical waste
				Auto waste segregation by using IOT
				Hazchemtrack:A smart Hazardous chemical management system for tannery labs
				Advanced thermochemical reactor for Hazardous Waste Upcycling
				Reblock:A sustainable approach to repurposing plastic waste in to paving Blocks
				AI-Driven smart waste management
				Chemical safety and management training software for fireworks Industry Employees

Water quality is closely monitored in accordance with Central Pollution Control Board (CPCB) standards to ensure compliance with national water safety guidelines. Regular audits are conducted by the Centre for Water Technology (CWT) to maintain quality assurance and promote continual improvement in water management. These initiatives not only conserve valuable freshwater resources but also contribute to maintaining the health of aquatic ecosystems downstream.



KARE's efforts are guided by comprehensive institutional frameworks such as the Water Conservation Policy and Recycle Policy, both of which outline systematic strategies for conservation, reuse, and pollution control. The institution also encourages behavioral changes through awareness programs, sensitizing students and staff to the importance of sustainable water practices. Through these collective actions, KARE has emerged as a model institution promoting responsible water stewardship and contributing meaningfully to SDG 14 objectives.

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Criminal Justice & Criminology
Economics & Finance
Education
Electronics and Communications Technology
Energy Science
Engineering
Environmental Health
Environmental Science/Climate Change & Mitigation
Fisheries Science & Marine Biology
Food Chemistry & Science
Hospitality & Tourism
Law
Library & Information Science
Materials Science
Mathematics
Mechanical Engineering
Media & Communications
Medicine & Health Sciences
Nanomedicine
Nanotechnology
Nutrition, Dietetics & Health
Pharmaceutical Science & Technology
Physics
Plant Science & Botany
Political Science / International Relations
Polymer Science
Psychology, Psychiatry & Mental Health

Suggested chapter titles
- Introduction to Microplastics
- Environmental Impact of Microplastics
- Microplastics and Human Health
- Analytical Techniques for Microplastic Detection
- Natural Degradation of Microplastics
- Role of Microbial Communities in Microplastic Degradation
- Enzymatic Breakdown of Microplastics
- Advances in Genetic Engineering for Biodegradation
- Bioplastics as Sustainable Alternatives
- Bioreactor Systems for Microplastic Mitigation
- Algae-Based Technologies for Microplastic Removal
- Bio-based Adsorbents for Microplastic Capture
- Microplastic Mitigation in Wastewater Treatment Plants
- Biotechnological Approaches for Industrial Microplastic Waste
- Policy and Governance for Biotechnological Solutions
- Economic Viability and Commercialization of Biotechnology-Based Solutions
- Public Awareness and Educational Strategies
- Future Directions in Biotechnology for Microplastic Mitigation

Submission Info and Dates:
Book Chapter title, abstract (300 words), keywords (5 minimum), list of authors, affiliations, and corresponding author email ID should be sent to: naresh@klu.ac.in

Extended date of Abstract Submission:
28th February 2025; Acceptance Notification: March 10th 2025; Full Chapter Submission: 15th May 2025;

Revised Chapter Submission: 30th June 2025; Full Chapter Acceptance: 28th July 2025.All submitted chapters will be peer-reviewed.

Authors must refer to the following link for detailed guidelines for chapter preparation: http://www.appleacademicpress.com/publishwithus

Note: Submitted manuscripts should not have been published previously, nor be under consideration for publication elsewhere.

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philosophies across diverse global contexts. For more information, please visit: Click here

New Book Series: AAP Advances in Materials, Manufacturing & Computational Intelligence Techniques plans to offer a comprehensive exploration of cutting-edge research and applications in various engineering and scientific fields. This multidisciplinary series caters to a wide range of readers, from researchers and academics to industry professionals, providing in-depth knowledge and practical insights into solving complex problems. The series explores into a diverse array of topics, including advanced materials, manufacturing techniques, and computational intelligence. For more information, visit: Click here

New Book Series: AAP Series on Waste Biomass Valorization will explore the transformation of biomass resources into valuable products, addressing the growing need for sustainable alternatives to fossil fuels and non-renewable resources. For more information and to propose a book, please visit: Click here

Congratulations to Hafiz Ansar Rasul Suleria, PhD, for receiving the Dean's Award for Excellence in Research from the University of Melbourne, Australia, in recognition for his exceptional performance and strong commitment to advanced research in food science. Dr. Suleria is editor of AAP's book series Innovations in Plant Science for Better Health: From Soil to Fork. For

2. Policies and Implementation for Wastewater Recycling and Pollution Control

KARE has institutionalized a robust framework of policies and operational practices to promote wastewater recycling, reuse, and pollution control. The Water Conservation Policy and Recycle Policy, accessible publicly through the university website, provide a transparent commitment to managing water responsibly. These policies emphasize reducing the environmental footprint of campus operations through systematic wastewater management, use of treated water, and prevention of waterborne pollution.

A dedicated Wastewater Treatment Plant (WWTP) within the campus treats greywater and sewage using biological and physicochemical processes. The treated effluent is reused for landscaping, gardening, and dust suppression, achieving near-zero liquid discharge. Routine monitoring ensures compliance with CPCB parameters for pH, turbidity, dissolved oxygen, and chemical oxygen demand (COD). These practices not only conserve freshwater but also protect aquatic ecosystems from potential contamination.

Awareness programs on water pollution control are regularly conducted for students, faculty, and the surrounding community. Through the Green Army Volunteers, workshops, and environmental drives, participants are educated on the harmful effects of chemical effluents, microplastics, and improper

waste disposal. The outreach programs in nearby villages focus on promoting community-level wastewater reuse and reducing runoff pollution, thereby linking campus sustainability with regional ecosystem preservation.

Sno	Faculty Name	Faculty ID	Category	Problem Statement	Project title
1	Dr. M. Jayalakshmi	MJLCSE	Textile Waste	1. Cotton and Linen to Bioplastic	Cotton and Linen to Bioplastic
				2. Multipurpose basket using Twine Thread	Multipurpose basket using Twine Thread
				3. Turning Waste Clothes into Pen	Turning Waste Clothes into Pen
				4. REPURPOSING TEXTILE WASTE INTO SUSTAINABLE JESMONITE PRODUCTS	Repurposing Textile Waste into sustainable Jesmonite Products
				5. Rewriting Waste by Transforming Cotton Garments into Chart Paper	Woven to written : A chemical journey from old garments to chart paper
				6. Design and development of next generation carton boxes	1. Eco-Friendly Fiberboards 2. Biodegradable Packaging Materials
				7. Sustainable Decorative Bricks from Textile Waste and Resin: An Eco-Friendly Alternative for Interior Applications	Decorative bricks from non-recyclabe clothes
				8. upcycling textile waste into durable resin tiles	Identifying appropriate resins (eco-friendly or recycled options) that can effectively bind with textile fibers and create durable, long-lasting tiles.
				9. INNOVATIVE DOORS FROM RECYCLED TEXTILES	Repurpose various forms of textile waste into

					thoughtfully designed bags and mats.
				10. INNOVATIVE WALL INSULATION SOLUTIONS USING RECYCLED FABRIC	to convert the different form of textile waste into Insulator.
3	Dr. Abhishek Tripathi	ATICSE	Waste Segregation	1. SMART WASTE SEGREGATION WITH REWARD SYSTEM	Reward-Based Waste Segregation via Web Portal
				2. SMART WASTE SEGREGATION AND NOTIFICATION SYSTEM	Camera-Based Waste Segregation with CNN and Notification System
				3. WASTE SEGREGATION PREDICTION USING MACHINE LEARNING	Predictive Waste Management Model Using ML in KARE Campus
				4. SMART WASTE SEGREGATION: A ROBOTIC ARM BASED APPROACH FOR EFFICIENT RECYCLING	
				5. BEYOND DOTS: MULTI USER BRAILLE CONVERSION FRAMEWORK UTILIZING PYTHON AND IOT	Braille 6-Key Text Conversion Box for Visually Impaired
				6. VISION AID	Built-in camera for zooming and color filtering to aid partially blind users.
				7. GARBAGE SORTING USING ARDUINO UNO WITH CONVEYOR BELT	
				8. METAL BTTLE SEGREGATION AND VENDING MACHINE	Bottle Segregation and Vendor Machine Integration

				9. WASTE SEGREGATION THROUGH CIRCULAR ECONOMY	Circular Economy App for Categorized Waste Producers and Industry Collection
				10. WET AND DRY WASTE SEGREGATION WITH LIQUID EXTRACTION	Garbage bin that segregates wet and dry waste
4	Dr.T.Ramesh	TRHMEC	Agricultural Waste	AI-OPTIMIZED TENSILE STRENGTH PREDICTION OF BIOCOMPOSITES USING AGRICULTUEAL WASTE	
				AI-DRIVEN DESIGN of ECO-FRIENDLY HYBIRD COMPOSITES USING PINEAPPLE LEAF AND JULIFLORA FIBERS	
				DEVELOPING A SUSTAINABLE CULTURE MEDIA FOR THE ISOLATION OF BACTERIAL CULTURE	
				BIODEGRADABLE PACKING USING BANANA PEEL	
				DEVELOPMENT OF ECO-FRIENDLY BLACKBOARD CHALK USING AGRICULTURAL WASTE	
				CONVERSION OF AGRI-WASTE INTO ECO-FRIENDLY BIOPLASTIC FILM: SUSTAINABLE MATERIAL APPROACH	
				SUSTAINABLE MATERIAL TESTING: EVALUATING THE EFFECTS OF BIO-ACETONE DERIVED FROM PADDY HUSK	

				ON COPPER-ABS 3D PRINTED COMPOSITES	
				PREDICTIVE ANALYSIS OF COMPOST COMBINATIONA WITH ORGANIC AND INORGANIC MATERILAS FOR CROP YIELD OPTIMIZATION USING MACHINE LEARNING	
				EFFECT OF ACETONE AND BIO-ACETONE SURFACE TREATMENT ON THE STRUCTUAL INTEGRITY AND SURFACE CHARACTERISICS OF PLA - 3D PRINTING FILAMNETS	
				DEVELOPMENTOF ECO-FRIENDLY 3D PRINTING FILAMENT USING BANANA PEDUCLE	
5	Mrs.S.Shanmuga priya	SSABOM	Medical Waste	1Advanced thermal solution for biomedical waste	
				2Ecofriendly bricks from biomedical waste	
				Durable Eco friendly tiles from biomedical waste	
				Self sealing sharp containers	
				Smart waste bin	
				Conversion of biomedical waste into potential fertilizers using green approach	
				Sustainable mulch- mat using biomedical waste	

				Auto sterilising bin	
				Web development for biomedical waste management in KMCH	
				Sustainable reuse of less contaminated gauze - A feasible approach for biomedical waste management	
6	Dr.Srinithi	JSRCHE	Hazardous Waste	Hazardous Chemical Tracking and Alert system for safe Laboratory Practices	
				Connecting Households With Hazardous waste Experts an mobile App:EcoDispose Hub	
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				Reblock:A sustainable approach to repurposing plastic waste in to paving Blocks	

				AI-Driven smart waste management	
				Chemical safety and management training software for fireworks Industry Employees	
7	Dr. Angshuman	ACYMEC	Metal Waste	1. APPLICATION OF ML FOR VISUAL IDENTIFICATION OF METAL/ALLOY IN SCRAP (Software model)	Visual identification of scrap metal
				2. REMOTE CONTROLLED CAR TO IDENTIFY FERROUS /NON-FERROUS METAL/ALLOYS BY ELECTROMAGNETIC DETECTION	Location identification & recording of scrap depending on nature
				3. CONVEYOR BELT WITH MAGNETIC PULLEY TO SEGGREATE FERROUS & NON-FERROUS SCRAP	Conveyor belt for metal scrap segregation
				4. IDENTIFICATION OF DIFFERENT E-WASTE & ELECTRICAL WASTE METALS/ALLOYS - COPPER & ALUMINIUM	Identification of non-ferrous scrap by sensor
				5. CONVEYOR BELT WITH PERMANENT MAGNETS BELOW BELT TO SEGGREGATE FERROUS & NON-FERROUS SCRAP	Segregation of ferrous & non-ferrous scrap
				6. CONVEYOR BELT WITH SENSOR & ROTATING FLAP TO SEGGREGATE FERROUS & NON-FERROUS SCRAP	Novel method for identification & segregation of metal scrap

				7. WEBSITE & SIMULATION FOR SCRAP TRACKING (LOGISTICS + PROCESSING) IN SCRAP YARD TO RECYCLING	Business model for attainment of circular economy in metal scral processising
				8. REUSE OF METALLIC SCRAP FOR FABRICATION OF HOUSEHOLD CHAIR	Reuse of metallic scrap for its efficient utilisation
				9. CONVEYOR BELT BASED SEGREGATION OF POLYMERS & METALS	Identification and segregation of polymer and metal scrap
8	Mr. Aravind Chandran	ACNCSE	Food Waste	1. HARNESSING EGGSHELL FOR SUSTAINABLE TABLEWARE: A NOVEL APPROACH TO BIODEGRADABLE PLATE PRODUCTION	
				2. AI-INTEGRATED EXTRACTION OF DIETARY FIBER FROM ORANGE AND BANANA PEELS: A SUSTAINABLE APPROACH	
				3. A SUSTAINABLE, FUNCTIONABLE WHEY BEVERAGE	
				4. SUSTAINABLE UTILIZATION OF GHEE RESIDUE: EXTRACTION, PROCESSING, AND EDIBLE APPLICATIONS	
				5. EGGSHELL-DERIVED CALCIUM SUPPLEMENTS-A	

				NOVEL SOLUTION FOR ANIMAL NUTRITION	
				6. A GREEN BIOPROCESS MODEL FOR CONVERTING GHERKINS WASTE INTO ECO-FRIENDLY CLEANING ENZYMES	
				7. BIOTECHNOLOGICAL VALORIZATION OF PRESERVED GHERKIN PROCESSING WASTE: A MULTI-STREAM APPROACH FOR SUSTAINABLE ORGANIC FERTILIZER PRODUCTION	
				8. DECOMPOSABLE GROWER POT USING MILLET HUSK	
				9. SUSTAINABLE MILLET HUSK BRICK	
				10. SUSTAINABLE FOOD PRESERVATION: DEVELOPMENT OF EDIBLE WAX COATINGS FROM ORANGE PEELS	
9	Ms. Elakkiya	MEABIO	Paper Waste	1 Development of Acoustic Panels from Recycled Paper Waste for Soundproofing Applications	Acoustic Sustainability
				2 Fabrication of Eco-Friendly Beeswax Wraps Using Paper Waste as a Sustainable Alternative to Plastic	Beeswax Alternative
				3 Design and Evaluation of Biodegradable Seedling Pots	Seedling Pots

				Made from Paper Waste for Sustainable Agriculture	
				4 Utilization of Paper Waste in the Manufacture of Lightweight, Insulating Ceiling BoardS	Ceiling Reuse
				5 Creation of 'EcoShield': A Thermal Insulating Material Derived from Paper Waste	EcoShield Innovation
				6 Production of Biodegradable Mulching Mats from Recycled Paper Waste for Moisture Retention in Crops	Mulching Mats
				7 Synthesis of Paper-Based Foam Material for Packaging and Cushioning Applications	Paper based foam
				8 Manufacture of Compressed Paper Bricks as a Low-Cost Building Material from Waste Paper	Paper bricks
				9 Conversion of Recycled Paper Waste into Durable Writing Boards for Educational Use	Writing boards
				10 Design and Production of Eco-Friendly Paper Pens as a Sustainable Alternative to Plastic Pens	Eco friendly pen
10	Dr.N.Chellidevi	NCIBOM	E-waste/ Battery	1 IOT-BASED SYSTEM FOR REAL-TIME MONITORING OF E-WASTE AND BATTERY HEALTH	Real time battery health monitor

				2 DEVELOPING A SMART COOLING SYSTEM FOR LAPTOPS	Smart coolant for laptops
				3 POWER-BANK FROM USED MOBILE BATTERIES	Power bank for mobile charging
				4 ENHANCING SUSTAINABILITY WITH RECYCLE CONNECT SOFTWARE	Online platform for recycling e-waste
				5 DEVELOPING A SUSTAINABLE SPEAKER SYSTEM FROM RECYCLE ELECTRONICS	Speaker system from e-waste
				6 E-WASTE UPCYCLING AND MANAGEMENT PLATFORM	Mobile app for e-waste management
				7 BLOCK CHAIN - BASED RECYCLING TRANSPARENCY SYSTEM	Block chain for e-waste tracking
				8 DEVELOPMENT OF HOLISTIC SYSTEM FOR E-WASTE SEGREGATION AND RECYCLING	Automatic classification and recycling of e-waste
				9 SMART E-WASTE MANEGEMENT : AN IOT ENABLED DUSTBIN SYSTEM FOR COMPONENT DETECTION	Smart dustbin for e-waste
				10 SECURITY CAMERA USING OLD SMARTPHONE	Surveillance camera from used mobile phone

Monitoring committees ensure that wastewater policies are fully implemented and reviewed regularly. KARE's commitment goes beyond compliance; it involves a culture of innovation through student-led research in bioreactors, biosorption techniques, and constructed wetlands. By integrating academic

research with sustainable campus operations, KARE exemplifies how higher education institutions can serve as living laboratories for achieving SDG 14 and related environmental goals.

3. Initiatives to Reduce Plastic Usage and Maintain a Plastic-Free Campus

Plastic pollution poses one of the greatest threats to aquatic life and ecosystems. In line with SDG 14's target to prevent and significantly reduce marine pollution of all kinds, KARE has undertaken strong measures to create a plastic-free campus environment. The Green Army, a student-led environmental volunteer group, spearheads campaigns to eliminate single-use plastics and promote sustainable alternatives such as cloth bags, metal bottles, and biodegradable packaging.

During 2023–2024, awareness programs were conducted both on campus and in nearby villages, notably in Mullikulam, to educate residents about the environmental hazards of plastic waste entering drainage systems and water bodies. The campaigns encouraged segregation at source, composting of biodegradable waste, and the use of reusable materials. Plastic-free signage has been installed throughout the campus to reinforce this cultural shift toward sustainability.

The institution has implemented a Plastic Waste Management Strategy that includes reducing plastic procurement, promoting eco-friendly vendors, and establishing proper collection and recycling mechanisms. Dining facilities have completely eliminated single-use cups, straws, and cutlery, replacing them with stainless steel and biodegradable alternatives.

KARE's research centers also contribute to addressing plastic pollution through projects focusing on microplastic removal from wastewater and biodegradable material development. These studies not only support campus sustainability but also contribute to national and global research efforts on marine pollution mitigation.

By embedding environmental responsibility into daily operations, KARE demonstrates that institutional policies, student engagement, and community participation can together drive impactful progress toward achieving a plastic-free environment, thereby advancing SDG 14's core mission of protecting life below water.

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