MANIPAL
ACADEMY of HIGHER EDUCATION
(Institution of Eminence Deemed to be University)

Report of Responsible Consumption and Production

The Department of General Services, MAHE

The department of general services headed by the Director is responsible for the supervision of estates, security, and maintenance of all support services like ancillary, civil, electrical, HVAC, telecommunication, transportation fleet, plumbing, and water supply. The various branches of the department maintain approximately 92 lakh sq ft of built area and are adept at driving efficiency, managing risks and crisis to ensure smooth seamless functioning of the institutions and hospitals in multi-locations. Application of state-of-the-art technology with an eye on efficiency, cost-effectiveness, and resource conservation is inbuilt into the team's DNA. This year saw an unprecedented pandemic and the department was at the forefront of delivering essential services during the nationwide lockdown by way of ensuring transportation, sanitization services, and operational planning for the continuation of campus activities. The team facilitated post lockdown reopening of the workplace as per prescribed safety protocols.

Introduction: Civil department focuses on the repair of buildings, replacement of concrete, plaster, masonry, wood, steel structures, painting, flooring work, roofing, and manholes repairs. Ancillary services work on housekeeping, road cleaning, solid waste and garbage management, facade cleaning, pest control, horticulture, landscaping, waste management, and composting. The electrical department maintains 33/11 kV substations and 36 nos.11/0.433 kV substations and performs the critical function of a 24/7 power supply. 100 per cent backup power supply is ensured through DG sets. The inclusion of green energy is one of the priority areas of focus along with fuel efficiency. Water supply and plumbing works act on plumbing complaints, supervise and monitor water supply system, operate, and maintain sewage treatment plants and greywater treatment plants. The air conditioning department has 17 central chiller plants with 8,000-standalone equipment operating on the campus. The department contributes to effective cost savings by optimizing the use of resources and efficiency improvement. HVAC systems are upgraded phase-wise to the best available energy-efficient technology. The telecommunications department enables MAHE to communicate effectively with its constituent units via intercom and cellular services. Maintenance is pro-actively planned to deliver a high standard of service including system upgradation. The transportation fleet ensures safe and secure mobility of university staff, students, and guests.

Environment management: Environment and Energy Management Systems are well established at the two campuses located at Manipal and Mangalore. The Environment, Energy Policy is the guiding document that enables the university to achieve continual improvement over time. Consistent efforts are made in implementing best practices in the areas of water and waste management, air quality, green cover, energy, and resource management.

Waste management on campus starts with source segregation, especially at residential units, canteens, and health care facilities. Post segregation scientific management is followed for different streams like e-waste, hazardous waste, biomedical waste, metal scrap, food, garden, vegetable, organic wastes, and inerts. This year approximately 60 per cent of waste generated in the Manipal campus was diverted from landfills thus preventing pollution to soil, air, and groundwater and reducing the health affecting the local area. Refer to Fig.1. The thermocol-melting unit installed on campus ensured zero disposal of all types of thermocol into the environment and instead produced approximately 700 kg of reusable byproduct.

Mini Bottling Kiosk is a new introduction on the campus where bottled drinking water is now produced and supplied in-house. The plant produces 200 ml, 500 ml, and 1000 ml of packaged drinking water in reusable glass bottles. The 200 ml bottles have now replaced the conventional PET packaged water at meetings and conferences whereas the 500- and 1000-

ml units are used in the hotel. Bulk requirements of 20 litres are also produced based on demand. The above initiative has brought down the PET waste generation close to zero and is a cost-benefit to the university.

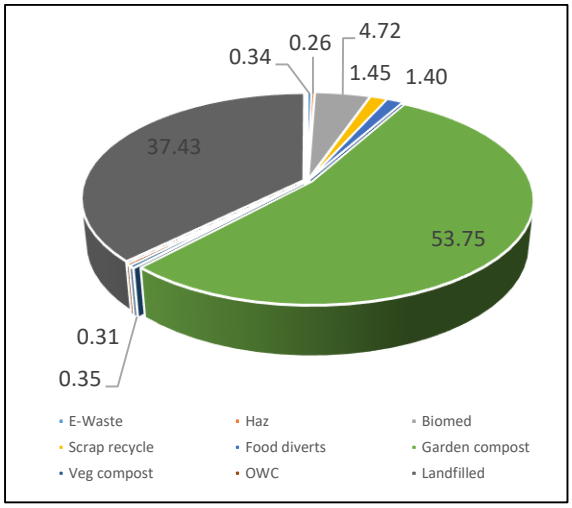

Fig1. Scientific management of waste (%) at Manipal.

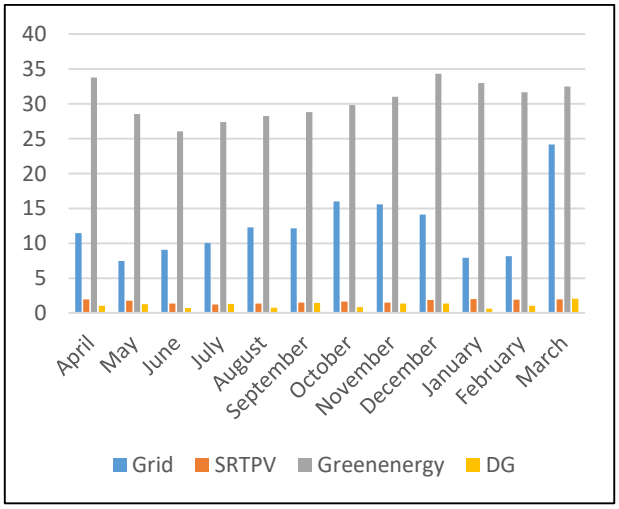

Fig2. Power mix in lakh units at MAHE campuses

Wastewater generated on campus is treated in a sewage treatment plant of capacity 6.5 million litres per day (MLD) at Manipal and 0.3 MLD at Mangalore. Treated water up to the tertiary level is reused in gardens. Greywater plants of capacity 0.3 MLD provide flush water to hostels. Water resource conservation is a continuous process with efficiency improvement by line loss monitoring and harvesting of rainwater to help groundwater recharge.

Energy management system was formally implemented in the year 2016 at the Manipal campus followed by implementation at Mangalore in the year 2019. Key focus areas are maximum load reduction, the introduction of measures to improve the quality of power by replacement with energy-efficient transformers, pumps, detuned filters for capacitor banks, CFL/LED lighting, auto-synchronization panels for load optimization and energy-efficient power equipment as certified by Bureau of Energy Efficiency (BEE). In the HVAC systems, the replacement of dated air-conditioning units with power-efficient units were undertaken phase-wise. Central air conditioning systems incorporating water-cooled screw chillers, and unitary air-conditioner controls with automation systems for buildings with sensors are incorporated. For efficient cooling, automatic switching on and off depending on occupancy or fixed schedule is installed to replace old systems. MAHE continues to fully rely on solar hot water systems for hot water use on campus and has phase-wise introduced heat pumps to further improve efficiency. Solar Rooftop Photovoltaic (SRTPV) installed capacity is 1463 kWp. Around 70 per cent of the electricity used on campuses is from a green source, as depicted in

Fig2 above. The energy-monitoring hub (EMH) helps in centralized monitoring of all sub-stations on campus as well as the air conditioning plants on campus. Real-time data availability helps in efficient monitoring and troubleshooting during breakdown incidents. This platform can be further enhanced to integrate remote controls from the EMH.

Ambient air quality (AAQ) is recognized as an important environmental indicator for human health. Six AAQ parameters measured show significantly lower concentrations compared to Central Pollution Control Board (CPCB) standards (STD) for residential zones (Fig3 below) and are much lower than those specified for ecologically sensitive zones which are more stringent.

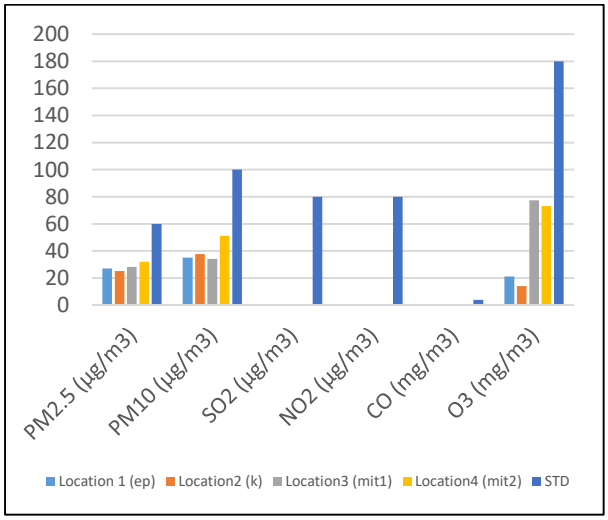

Fig 3. AAQ Vs CPCB Standards at 4 locations

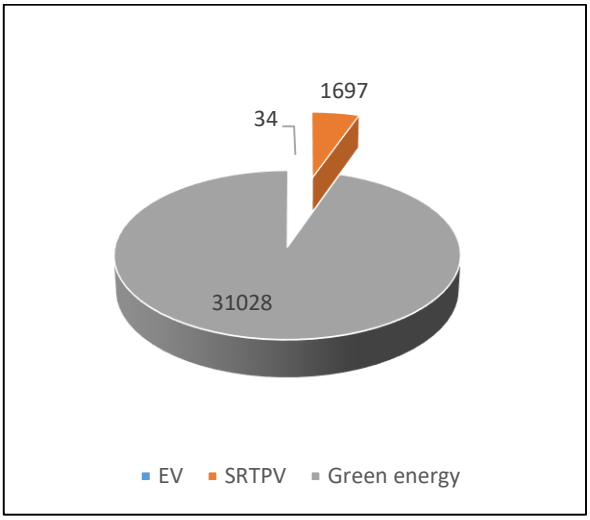

Fig 4. CDE Emission reductions in MT.

The pleasant ambience of the campus is maintained and developed through a plantation of saplings during various occasions, one of them being the world environment day on 5 June as well as on a continuous basis. MAHE recognizes that vehicular emissions significantly affect the air and hence utilizes four fully electric vehicles (EVs) for airport transfer of students, staff, and guests. This year 70 per cent of the airport trips were catered to by EVs, two security patrol vehicles are now EVs, and this has helped to offset 100 per cent carbon emissions that would have otherwise occurred due to conventional patrol vehicles. In addition, one electric three-wheeler load carrier has offset carbon emissions up to one metric ton.

Carbon emission reduction: Strategies adopted like the use of exam pads, an electronic device for examinations replacing conventional answer scripts, have saved 113 trees from being felled. Green energy use on campuses accounts for 70 per cent of total consumption thus reducing 31,028 MT of CDE emissions and self-generated solar power prevented 1,697 MT of CDE emissions into the atmosphere. Total CDE emission reductions including electric vehicles (EV) are projected in Fig4 above. This year the UI Green Metric Ranking Agency

ranked MAHE as the greenest suburban campus in India, 137th in the overall category and 47th in the suburban category.

MCODS Mangalore

All other activities in the department relating to the program/course:

Sl. No.	Activity	Particulars	Date(s)
Administration			
1	Plastic Waste Management Awareness	Under the banner of Azadi ka Amrit Mahotsav, MCODS Mangalore conducted the Swachhata Hi Sewa awareness event about plastic waste management on 22 October 2021. A much-needed initiative to phase out single-use plastics and raise awareness against them was carried out in the college. A PowerPoint presentation was also used to give more detailed and descriptive information. The plastic waste management amendment rules 2021 were highlighted during the awareness program. The types of single-use plastic materials that have been banned were also discussed among the audience.	22 October 2021
2	Clean India Program	Clean India program–on 22 October 2021 at MCODS Mangalore. Clean India program an event organized by the Department of Youth Affairs was conducted on 22 October 2021 at MCODS Mangalore. An attempt to sweep away waste, especially single-use plastic and maintain our surroundings was carried out in the college. A good amount of time was spent with all the student staff and supporting staff ready with their gloves to pick up the little bits of waste from surrounding areas. Needless to say, there was active participation from the students, staff and the supporting staff to conduct the cleanliness drive. This initiative raised awareness about the harm single-use plastic has done to our environment. The event both raised awareness and cleaned our surroundings leaving both students and staff with a zeal to carry out many more events such as these.	22 October 2021

MSLS

All other activities in the department relating to the program/course:

Sl. No.	Activity	Particulars	Date(s)
1	Webinar entitled "Plant-Environment Interactions and Sustainable production" through Microsoft Teams	The talks during the webinar focused on how plants constantly interact with biotic as well as abiotic factors. The webinar also covered sustainable production through innovation and technology and reducing food loss and waste. The year 2021 has been designated by the UN General Assembly as the International Year of Fruits and Vegetables (IYFV). This intends towards raising awareness of the important role of fruits and vegetables in human nutrition, food security and health as well as in achieving the UN Sustainable Development Goals, as fruits and vegetables are good sources of dietary fibre, vitamins and minerals and beneficial phytochemicals.	10 February 2021

MSAP

Books/chapters authored by faculty members:

Sl. No.	Name of the Book	Chapter(s) name (if authored, chapters only)	Faculty members	Publisher	Date
9	Contaminants of Emerging Concerns and Reigning Removal Technologies 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Solid Waste and Landfill Leachate: A transient source of emerging microbes and legacy contaminants for groundwater pollution.	Dr Sasmita Chand	Springer Nature Switzerland	1 October 2021

DOC

Sl. No.	Activity	Particulars	Date(s)
23	Clean India Program 	The Department of Youth Affairs, Ministry of Youth Affairs and Sports has initiated the Clean India Program, a program covering 250 lakh villages that involve around 30,000 educational institutions. The program involves a cleanliness drive that includes cleaning up waste, collecting single-use plastic and many other activities. As a part of the same, DOC organized a cleanliness program on 29 October 2021, where students and faculties of the department cleaned the areas near Kamath Circle.	29 October 2021

DOD

Institutional Activities/Curricular Activities
All other activities in the department relating to the program/course:

Sl. No.	Activity	Particulars	Date(s)
3	Guest lecture- BDes (FD) and MA (FM) 	The purpose of the guest lecture is to introduce sustainable concepts through zero-waste design. The speaker, Designer Uma Lakshmi Rachakonda emphasized the need for sustainable approaches in the fashion industry. The fashion industry contributes to approximately 20 per cent of global waste and 10 per cent of global carbon emissions making it the biggest polluter in the world only next to the oil industry (UNEP 2018). The following outcomes are achieved through the guest lecture: 1. Sensitizing students to think of different strategies such as zero-waste fashion, upcycling, design for disassembly etc, would help in moving towards green fashion. 2. Understand the application of zero-waste fashion through designing, planning for garment construction, layout for zero-waste and construction of zero-waste garments. 3. Address the Sustainable Development Goal -SDG12 of sustainable consumption and production.	11 September 2021

4	Guest lecture- MA (Fashion Management) 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	The online session on "Forecasting Fashion and Sustainability" by Ms Renuka C Shekhar was very informative. The expert gave a clear picture of the significance of implementing sustainable fashion practices from the consumer and designer levels to save the environment. The influence of sustainable practices on the fashion forecasting process was also briefed, along with identifying the trends and forecasting fashion. This is a national event attended by BDes (FD) and MA (FM) Students. Outcome: The session on "Forecasting Fashion and Sustainability has enabled our students to have a clear idea of the importance of implementing sustainable fashion practices while designing or consuming fashion products and when disposing of them. The guest lecture briefed the fashion forecasting process and general and sustainable fashion forecasting agencies.	6 November 2021

Details of Guest Visit (lectures, collaboration, visitors on campus)
Guest Lectures:

Sl. No.	Visitor	Name of the Organization	Purpose of Visit	Date of Visit
9	Ms Lakshmi Uma Rachakonda 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Ethical Fashion Designer	Lecture by Ms Lakshmi Uma Rachakonda on the topic "Sustainable Fashion with emphasis on zero-waste design" for all batches of BDes (FD) and MA (FM) students scheduled on Saturday 11 September 2021 held online through MS Teams to all batches of BDes (FD) and MA (FM). The purpose of the guest lecture is to introduce sustainable concepts through zero-waste design. The speaker, Designer Uma Lakshmi Rachakonda emphasized the need for sustainable approaches in the Fashion industry. The fashion industry contributes to approximately 20 per cent of global waste and 10 per cent of global carbon emissions making it the biggest polluter in the world only next to the oil industry (UNEP 2018). Fast fashion, which rose to prominence at the turn of the 21st century had added to the industry's enormous greenhouse gas emissions and devastating environmental impact. We must move towards strategies that would aid in reducing the negative impact of the fashion industry. The speaker shared her collection based on the zero-waste fashion which was showcased at the West Valley annual fashion	11 September 2021

			show in 2019. Six faculties and 55 students participated. The following outcomes are achieved through the guest lecture: Sensitizing students to think of different strategies such as zero-waste fashion, upcycling, design for disassembly etc that would help in moving towards green fashion. Understand the application of zero-waste fashion through designing, planning for garment construction, layout for zero-waste and construction of zero-waste garments. Address the SDG12 of sustainable consumption and production.	
19	Renuka C Shekhar 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Fashion Designer, Business Coach and International trainer	The session was given by Renuka C Shekhar on the topic “Forecasting Fashion and Sustainability” to our first-semester MA (FM) students on Saturday 6 November 2021 through Microsoft Teams. The online session was very informative. The expert gave a clear picture of the significance of implementing sustainable fashion practices from the consumer and designer levels to save the environment. The influence of sustainable practices on the fashion forecasting process was also briefed, along with identifying the trends and forecasting fashion. Outcomes of the program were: “Forecasting Fashion and Sustainability” has enabled our students to have a clear idea of the importance of implementing sustainable fashion practices while designing or consuming fashion products and when disposing of them. The guest lecture briefed the fashion forecasting process and general and sustainable fashion forecasting agencies.	6 November 2021

Awards/Recognitions:
Faculty

Sl. No.	Name	Details	Date
1	Resmi G	Conducted online session on the Guest lecture on "Medical Textiles" for first-year PG students of the Department of Textiles and Clothing organised by Avinashilingam	31 May 2021

	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Institute for Home Science and Higher Education, Coimbatore, Tamil Nadu	

Extra-Curricular Activities:
Cultural Activities:
In Institution:

Sl. No.	Event	Details	Date(s)
3	Awareness against single-use plastic – Quiz Competition 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Theme-Awareness against single-use plastics through online mode via MS forms. Around 97 students participated in the competition.	23 October 2021

Inter Institution:

Sl. No.	Event	Details	Date(s)
2	E-poster making competition 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	E-Poster making competition under Nasha Mukt Udupi Abhiyan organized by: Department of Students Affairs, MAHE, through online mode.	26 June 2021

MAHE Dubai Campus

Inter Institution:

Outside University

Sl. No.	Event	Details	Date(s)
2	E-Waste collection	The Manipal Environment Conservation Society (MECS) club has initiated an e-waste recycling station at the campus. It is an all year long ongoing process. Students are urged to collect e-waste from the neighbourhood and deposit it at the campus. This will be handed over to an	2 April 2021

		agency and they would recycle it. From April to June 2021, around 1,000 kg was collected from students and handed over to Enviroserve. For this initiative, MAHE Dubai has won the "Sustainable Campus Initiative–Sci Award" from Environment Agency, Abu Dhabi.	