# GREEN AUDIT REPORT

## K.R. MANGALAM UNIVERSITY

## Address – Sohna Road

## Gurugram, Haryana 122103

**Audit Date – 05th March, 2021**

**Audit Conducted by:**

**M/S SAMARTH MANAGEMENT PRIVATE LIMITED**

**212, BHERA ENCLAVE, PASCHIM VIHAR, DELHI – 110087**

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THIS IS CERTIFY THAT **K. R. MANGALAM UNIVERSITY**

HAS SUCCESSFULLY

COMPLETED THE **GREEN**

AUDIT PROGRAM

CONDUCTED ON **05 MARCH 2021**

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CERTIFICATE NO. **SMPL/2021/C-0008** DATE OF ISSUE **16-03-2021** AUTHORISED SIGNATORY

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## ABOUT SAMARTH MANAGEMENT PRIVATE LIMITED

M/s SAMARTH MANAGEMENT PRIVATE LIMITED is a Management and Environmental Consulting Organization working in the Environmental field since 2004. The organization has a team of Environment Experts with wide knowledge in the subject. SMPL is providing services for various sectors such as

- Preparing Environment Impact Assessment (for Building & Construction Projects, Small and big manufacturing units, Hospitals, Educational Institutions, Hotels etc.)
- Samarth Management Private Limited has prepared Green Audit reports for various institutes and organizations.
- Team involved in this auditing and report preparation is given below:

| Name | Designation |
|---|---|
| Mr. Raghav Arora | Auditor |
| Ms. Palak Ahuja | Auditor |

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## ABOUT KRMU

K.R. Mangalam University is the fastest-growing higher education institute in Gurugram, India. Since its inception in 2013, the University has been striving to fulfill its prime objective of transforming young lives through ground-breaking pedagogy, global collaborations, and world-class infrastructure.

As we have stepped into the innovative world, we have gained exposure to unlimited learning and employment opportunities beyond the social and geographical boundaries. K.R. Mangalam University being a progressive learning platform is a host to knowledge-seekers from across the globe. KR Mangalam University aspires to become an internationally recognized institution of higher learning through excellence in interdisciplinary education, research and innovation, preparing socially responsible life-long learners contributing to nation building.

K. R. Mangalam University education carries a strong emphasis on foundational knowledge, thorough academic research based on rigorous pedagogy and hands-on experience with real-world challenges. The synthesizing nature of the curriculum allows the student to learn by making connections between ideas and concepts across different disciplinary boundaries. The interdisciplinary structure at K. R. Mangalam University is designed to enable the integration of ideas & the characteristics from across disciplines.

- BASIC AND APPLIED SCIENCES
- ENGINEERING AND TECHNOLOGY
- MEDICAL AND ALLIED SCIENCES
- MANAGEMENT AND COMMERCE
- LEGAL STUDIES
- HUMANITIES
- EDUCATION
- HOTEL MANAGEMENT & CATERING TECHNOLOGY
- AGRICULTURAL SCIENCES
- ARCHITECTURE AND PLANNING
- FASHION DESIGN
- JOURNALISM & MASS COMMUNICATION

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## 1. INTRODUCTION

The green audit aims to analyze environmental practices within and outside the university campuses, which will have an impact on the eco-friendly atmosphere. Green audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of the university environment. It was initiated with the motive of inspecting the effort within the institutions whose exercises can cause threat to the health of inhabitants and the environment. Through the green audit, a direction as to how to improve the structure of the environment is established.

### 1.1. NEED FOR GREEN AUDITING

Green auditing is the process of identifying and determining whether institutions' practices are eco-friendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources like energy, water has become a habit in common areas. Now, it is necessary to check whether our processes are consuming more than required resources? Whether we are handling the natural resources carefully? Green audit regulates all such practices and gives an efficient way of natural resource utilization.

In the era of climate change and resource depletion it is necessary to verify the processes and convert it into a green and clean one. Green audit provides an approach for it. It also increases overall consciousness among the people working in institutions towards a sustainable environment.

### 1.2. GOALS OF GREEN AUDIT

University has conducted a green audit with specific goals as:

- Identification and documentation of green practices followed by the University.
- Identification of strengths and weaknesses of the University in green practices.

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- Analyze and suggest solutions for problems identified.
- Assess facility of different types of waste management.
- Increase environmental awareness throughout campus
- Identify and assess environmental risk.
- Motivates staff for optimized sustainable use of available resources.
- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issues before they become a problem.

## 1.3. OBJECTIVES OF GREEN AUDIT

i. To examine the current practices, which can impact on the environment such as resource utilization, waste management etc.
ii. To identify and analyze significant environmental issues.
iii. Setup goal, vision, and mission for Green practices on campus.
iv. Establish and implement Environment Management in various departments.
v. Continuous assessment for betterment in performance in green

## 1.4. BENEFITS OF GREEN AUDIT TO EDUCATIONAL INSTITUTIONS

There are many advantages of green audit to an Educational Institute:

i. It would help to protect the environment in and around the campus.
ii. Recognize the cost saving methods through waste minimization and energy conservation.
iii. Empower the organization to frame a better environmental performance.
iv. It portrays a good image of the institution through its clean and green campus.

## 2. OBJECTIVE AND SCOPE

The broad aims/benefits of the eco-auditing system would be

- Environmental education through systematic environmental management approach.
- Improving environmental standards.

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- Benchmarking for environmental protection initiatives.
- Sustainable use of natural resources in the campus.
- Financial savings through a reduction in resource use.
- Curriculum enrichment through practical experience.
- Development of ownership, personal and social responsibility for the University campus and its environment.
- Enhancement of College profile.
- Developing an environmental ethic and value systems in young people.

## 3. EXECUTIVE SUMMARY

A green audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. This audit report contains observations and recommendations for improvement of environmental consciousness.

### i. Energy use

As part of its focus on energy management, KRMU will strive towards ensuring:

1.1 Inspection of the campus facilities every semester to identify, maintain and repair faulty or broken equipment on campus, such as ICT equipment, electrical devices, electrical panels, etc.

1.2 Adoption of energy efficient equipment/appliances and fixtures such as LED lights, Solar lights in the campus.

### ii. Water Management

As part of its focus on water management, KRMU will strive towards ensuring:

2.1 Inspection of the campus facilities every semester to identify and repair any faulty installations such as pipes, taps, flushes, etc. which may lead to leaks and wastage of water.

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2.2 The exploration of water recycling mechanisms through collaborations with appropriate organizations.

2.3 Adoption of rainwater harvesting techniques and proper utilization of the same.

### iii. Waste Management

As part of its focus on waste management, KRMU will strive towards ensuring:

3.1 Appropriate e-waste management practices for collection, disposal or recycling of such waste.

3.2 Adoption of waste segregation methods such as appropriately placed dustbins for dry and wet waste.

3.3 Minimal use of paper in the campus in all aspects of administrative and academic functioning by utilizing ERP and emails to the extent possible.

3.4 Minimal use of plastic on campus to reduce non-recyclable waste.

### iv. Landscaping and gardening

As part of its focus on building a green campus, KRMU will strive towards ensuring:

4.1 Expansion of green cover in the campus through investments in gardening and landscaping activities.

4.2 Active engagement with the community for increasing green cover in the surrounding areas.

## 4. KRMU INFRASTRUCTURE

The KRMU campus is spread over 26,486 acres. with state-of-the-art infrastructure with modern settings and cutting-edge apparatus that helps students on practical skills within the campus. All indoor venues are air-conditioned, have adequate lighting, ICT facilities i.e. Wi-Fi, LAN, and LCD projectors are divyangjan accessible.

### 4.1. DETAILS OF TREES AND PLANTS IN CAMPUS

Two-tier plantations have been done along the campus boundary. Fruit bearing and

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shady plants like Ashok, Sondana, Kusum, Vismarkya, Kachnar, Pilkan, Sashut, Champa etc are planted. A nursery, and a well functional green house, composting unit to provide organic manure and trained manpower to carry out horticulture work is maintained. An organic orchard is created which harbors a large number of horticulture plant varieties. Due to natural vegetation patches, the university is ecologically sound and is home for a large number of birds and butterflies. 120 birds and 40 butterflies are documented inside campus during biodiversity survey.

## 4.2. WASTE MANAGEMENT

Management of the various types of Degradable and Non-Degradable waste at the campus. There are different types of waste that are produce

- **Biodegradable Waste**
- **Non-Biodegradable waste.**

Biodegradable materials are those, which degrade or break down in a natural manner. In other words, their decomposition happens with the help of natural agents like sunlight, microorganisms, water, ozone and more which turns it into organic manure.

Non-biodegradable substances are materials which do not degrade easily. As they are synthesized and do not occur naturally, degradation is impossible with these products. Therefore, when they stay in the ecosystem for a long period and do not decompose, they harm our environment. The Institution adopts several measures for management of the various types of degradable and non-degradable waste at the campus.

Some of them are -

- The Institution provides small dustbins in every class room and faculty rooms and encourages students and faculties to throw their waste specifically in the

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dustbins.

- KRMU has ensured installation of big dustbins near the Canteen area to promote amongst students the habit of disposing waste in bins.
- The Institution also encourages the use of 3 different dustbins i.e., Green, Blue and Yellow Dustbins. The same is done to segregate the waste.
- At each floor of the institute, near the washrooms big dustbins have been kept.
- Incinerators are used for waste management.

## a. USE OF DEGRADABLE WASTE

Due to the canteen in the college premises itself; there is a lot of degradable waste generated. This includes, vegetable peels, leftover food etc. All this waste is collected and used in the compost pit dug in the college itself. This not only helps in proper management of waste but also aids in the growth of other plants as the compost is later used as Organic Compost or Organic Natural Fertilizer.

## b. RAIN WATER HARVESTING

Conserving and preserving water are a key issue that has been addressed by the University in the form of Rain water harvesting. The campus has been practicing rainwater mechanisms in a site area of 26 acres approx. where there are 17 rain water harvesting pits all over campus. This mechanism ensures an increase in the water table index. The details of the rainwater harvesting system have been designed by a certified architect and have been implemented throughout the campus. Average yearly rainfall data of Gurugram tabulated below: -

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| | Avg. Temperature °C (°F) | | Min. Temperature °C (°F) | | Max. Temperature °C (°F) | | Precipitation / Rainfall mm (in) | | Humidity (%) | Rainy days (d) |
|---|---|---|---|---|---|---|---|---|---|---|
| **January** | 11.5 °C | (56.4) °F | 7.6 °C | (45.6) °F | 20.1 °C | (68.2) °F | 23 | 0 | 66% | 1 |
| **February** | 15 °C | (62.6) °F | 10.5 °C | (50.9) °F | 23.8 °C | (74.8) °F | 31 | -1 | 59% | 5 |
| **March** | 20.8 °C | (73) °F | 15.3 °C | (59.6) °F | 30.2 °C | (86.3) °F | 20 | 0 | 45% | 6 |
| **April** | 26.4 °C | (85) °F | 21.2 °C | (70.1) °F | 37 °C | (98.6) °F | 13 | 0 | 27% | 1 |
| **May** | 29.1 °C | (91.6) °F | 25.6 °C | (78.1) °F | 40 °C | (104) °F | 19 | 0 | 30% | 0 |
| **June** | 28.4 °C | (92.1) °F | 28 °C | (82.4) °F | 31.7 °C | (101.6) °F | 71 | -2 | 45% | 5 |
| **July** | 30.2 °C | (86.4) °F | 26.9 °C | (80.4) °F | 34.1 °C | (93.4) °F | 197 | -7 | 69% | 18 |
| **August** | 29 °C | (84.2) °F | 26 °C | (78.8) °F | 32.6 °C | (90.7) °F | 180 | -7 | 75% | 16 |
| **September** | 22.2 °C | (82.7) °F | 21.1 °C | (75.4) °F | 28.7 °C | (90.9) °F | 90 | -3 | 69% | 0 |
| **October** | 25.8 °C | (78.4) °F | 19.3 °C | (66.8) °F | 32.4 °C | (90.4) °F | 14 | 0 | 52% | 0 |
| **November** | 20.8 °C | (69.4) °F | 14.3 °C | (57.7) °F | 27.8 °C | (82) °F | 5 | 0 | 52% | 0 |
| **December** | 15.5 °C | (59.9) °F | 9.2 °C | (48.6) °F | 22.4 °C | (72.3) °F | 7 | 0 | 60% | 2 |

Dimension of Rain Water Harvesting Pits and Desilting Pits as appended below: -

**Water Harvesting Pits**

- Depth - 3 Mtr
- Diameter – 3 Mtr
- Volume -3X3X670 (average rainfall in mm) X 0.8 =3216 Liters/pit X17 Nos pits Total=54672 Liters

**Desilting Pits**

- Depth - 03 Mtr
- Area - 3x3Mtr

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**c. SEWAGE TREATMENT PLANT**

The University has a Sewage Treatment Plant of 100 KLD capacity, which is utilized for

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treating waste water of the hostel and all other blocks. There is 100% utilization of liquid waste within the campus. The treated water is stored in tanks and further utilized for gardens. Low flush cistern and sensor-based water tapes have been installed in washrooms to minimize wastage of water.

It is submitted that various faculties have approached for obtaining various types of data pertaining to waste management for the last 05 years. The university has not maintained any record pertaining to waste management nor is any corroborated record held. The following type of waste is being generated in the university campus and quantity is calculated based on average of certain items received and the waste material sold out to vendors during last 02 years: -

**Solid**

| Ser | Type/ Name of waste material | Approx. Qty per day | Method of Disposable |
|---|---|---|---|
| (a) | Paper Glass/ Paper Plates/ papers | 1.8 Kg | Handed over to Hired contractor |
| (b) | Plastic spoons/Polythene bags/ plastic bottles | 1.2 Kg | Handed over to Hired contractor |
| (c) | Waste food | 9.5 Ltr | Handed over to Hired contractor |
| (d) | Grass/ Tree leaves | 48 Kg | Disposed in field earmarked |
| (e) | News papers | 450 Gm | Sold to scrap vendors |
| (f) | Card Boards | 3.8 Kg | Sold to scrap vendors |
| (g) | Papers/Projects | 2.8 Kgs | Sold to scrap vendors |
| (h) | Empty plastic canes/ drums/ buckets | 280 Gm | Sold to scrap vendors |

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| | | | |
|---|---|---|---|
| | etc | | |
| (i) | CFL<br>LEDs | 5355<br>281 | Sold to scrap vendors |

**Liquid**

(a) **Water**. The potable water (averagely 60 Bottles per day) is being procured for the university. On an average 55,000 Ltr water per day is used in hostels. Water meter is not installed in A, B & C block, therefore actual consumption of water cannot be ascertained, however approx. 28, 000 Liters water is consumed in A, B & C block.

(b) **STP**. A STP has been installed in campus which is capable of treating 100000 Liters of water per 24 hrs. The STP is being run 12 hours per day as per contract, therefore on an average per day 50000 Liters of water is being treated. The treated water is used for irrigation of plants.

(c) **Oil**. There are three DG sets in the university as power back up during failure of the main electrical supply. On an average 45 Ltr waste oil is generated this yea. The waste oil is contained in a leak proof container and sent to the Head Office for further disposed-off.

## 5. ENERGY MANAGEMENT

### 5.1. DIESEL GENERATOR DETAILS

The KRMU has installed 3 Nos. of Diesel Generator. The following table provides the Diesel Generator capacity in the University.

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| S. No | Equipment Name | Make | Capacity in (kVA) |
|---|---|---|---|
| 1 | Diesel Generator - 01 | Cummins | 625 kVA |
| 2 | Diesel Generator - 02 | | 380 kVA |
| 3 | Diesel Generator - 03 | | 250 kVA |

## 5.2. ALTERNATE SOURCES OF ENERGY AND ENERGY CONSERVATION MEASURES AT THE CAMPUS

The Institution has facilities for alternate sources of energy and energy conservation measures

1. Solar energy
2. Use of LED bulbs/power efficient equipment
3. Other measures

### 1. Solar Energy

The Institute has taken initiative to install solar lights in the garden and also intends to increase campus wide solar light usage. The University has a solar power generating system of 310 KW on the rooftop of the academic building A, B, C blocks, DG room and the hostel building. The solar system is wheeled to the grid.

| Data for Solar Panels | | | | | | |
|---|---|---|---|---|---|---|
| **Sr. No** | **Building** | **No. of Panels** | **Total no. of solar panels** | **Capacity** | **Total capacity** | **Rebate rate** |
| 1 | A | 157 | 984 | 310 Kw/day | 41850 units/month | 0.25 |
| 2 | B | 375 | | | | |
| 3 | C | 204 | | | | |
| 4 | DG | 120 | | | | |
| 5 | Hostel | 128 | | | | |

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**2. Power efficient equipment**

Power crisis is one of the most common problems in India. With the help of LEDs, we can eliminate this shortage by minimizing the wastage of electrical power or saving our generated power. Light-emitting diodes (LED) are one of today's most energy-efficient and rapidly developing lighting technologies. Quality LED light bulbs last longer, are more durable, and offer comparable or better light quality than other types of lighting. Energy Savings with use of LED is a highly energy efficient lighting technology, and has the potential to fundamentally change the future of lighting. LED bulbs were used for newly constructed buildings and some of the incandescent and fluorescent tube lights were replaced with LED bulbs. Majority of the class rooms, laboratories, administrative blocks, computer centers, libraries, seminar halls and staff rooms were provided with LED lighting systems which are supposed to be Energy efficient. Now, the power consumption through lighting systems is about 20 percent by LED bulbs.

This initiative is very low cost and also power saving. It also minimizes the electric bills of the institute. Moreover, it creates an opportunity for minimizing the load shedding in the campus.

**3. Other Measures**

- Energy efficient electronic gadgets are used and maintained regularly to achieve energy conservation.
- Campaigns on awareness on energy conservation are made available in all relevant locations.
- Unwanted usage of power is discouraged in the Institute.
- Institute has conducted various awareness drives in campus to ensure saving water & electricity.
- Star rated refrigeration system
- Use of induction in pantry

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- Awareness on how to conserve energy during the day time

## 6. GREEN CAMPUS INITIATIVES/ACTIVITIES BY KRMU

**Restricted Entry of Automobiles:**

The University implements no automobile policy in the campus. All the vehicles of employees and students are parked in the designated parking area. There are separate gates for entry and exit of vehicles. Inside the campus there is no entry of vehicles of any kind.

**Pedestrian Friendly Pathways:**

The university has pedestrian friendly pathways as a part of Green Campus & Environmental Sustainability where pedestrians can walk safely through the designated pathways. The building plan and architecture are planned in user friendly that promotes walkability. Proper footpaths are made along the roads within the campus and are well maintained in terms of quality with lush green belts accompanying the roadsides. Campus is developed in walk friendly manner with network of pedestrian walkway across the campus and to discourage use of vehicles inside the campus.

## 7. SUMMARY

Green Audit is one of the important tools to check the balance of natural resources and its judicial use. Green auditing is the process of identifying and determining whether institutional practices are eco-friendly and sustainable. It is a process of regular identification, quantification, documenting, reporting and monitoring of environmentally important components in a specified area. K.R. Mangalam University has conducted a "Green Audit" in the year 2020-2021. The main objective to carry out a green audit is to check the green practices followed by KRMU and to conduct a well-defined audit report to understand whether the KRMU is on the track of sustainable

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development.

## 8. CONCLUSION

From the green audit following are the conclusions, which can be taken for improvement in the campus.

- Reducing the use of one-time use plastic bottles, cups, folders, pens, bouquets, decorative items will be useful to solve the problem of plastic pollution to some extent.
- Wear Mask Signage are provided in the facility.
- Rainwater is collected from the rooftop to recharge the groundwater level table.

## 9. RECOMMENDATIONS

Following are some of the key recommendations for improving campus environment:

i. The solid waste should be reused or recycled at maximum possible places.

ii. KRMU shall dispose of E-Waste, Hazardous Waste, Solid and Liquid waste and Bio medical waste to MOEF and CPCB approved recyclers to ensure responsible disposal of its waste in advanced manner.

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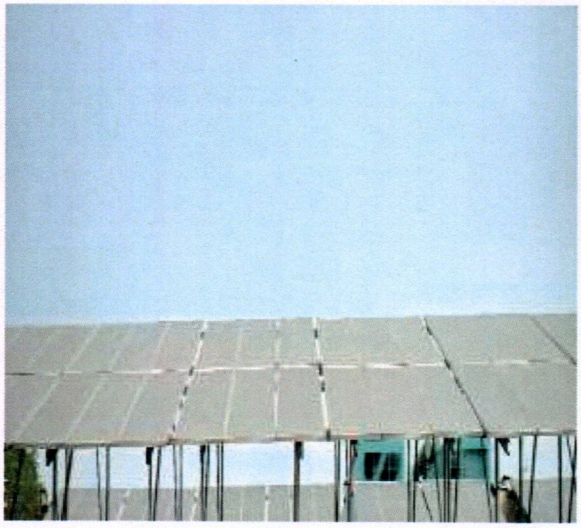
## 10. ANNEXURE-1 PHOTOGRAPHS

| CNG Buses | Solar Panels |
|---|---|
|  |  |
| **RWH** | **Waste Management** |
|  |  |

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## Greenery in University

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