Marwadi University
Marwadi Chandarana Group

GREEN AUDIT REPORT

2017-2018

Marwadi University

Rajkot-Morbi Road, Rajkot – 360003
Gujarat, India

Submitted By

Green Audit Team

TABLE OF CONTENTS

ACKNOWLEDGEMENT

Green Audit Assessment Team thanks to the Dean, Marwadi University, Rajkot for assigning the task of Green Audit of the university campus to us. We appreciate the cooperation that we got from all the faculties and students during the entire process. Our special thanks to Prof. (Dr.) Yogesh Kosta, Provost and Shri Naresh Jadeja, Registrar of the university for their warm support and encouragement from the very beginning till the end of the process.

The entire team is very grateful to the management of Marwadi University for their continuous support and motivation to take various innovative and challenging assignments.

Dr. Tarak Vora
Team Leader
Green Audit Team
Marwadi University. Rajkot

DISCLAIMER

Green Audit Team Has prepare this report on the basis of primary data collected from the different areas of the university. All reasonable care has been takesn in its preparation: details contained in this reprort have been compiled in good faith based on information gathered.

Date: 25/03/2018

Prepared by:
Green Audit Team

1. BRIEF ABOUT MARWADI UNIVERSITY

In 2007-08 the availability of world class academic facilities in the Saurashtra region were sparse; which encouraged Marwadi Group, Rajkot to launch Marwadi Education Foundation's Group of Institutes, offering Technical and Professional UG & PG courses and programs such as B.E, MBA and MCA. Marwadi Education Foundation's Group of Institutions (MEFGI) was incepted as a major organ of Marwadi Education Foundation's Group of Institutions in 2008, under the Bombay Public Trust Act 1950. Marwadi Education Foundation's Group of Institutions is a body promoted by Marwadi Shares & Finance Limited; a major stock broking company in India & Chandarana Intermediaries Brokers Pvt. Ltd. Since its inception Marwadi Education Foundation's Group of Institutions were affiliated with Gujarat Technological University.

Commitment to provide best and industry relevant education received an overwhelming trust from the society and in order to blend Engineering with Science and support them through Management and Law disciplines and have multi disciplinary course offerings in Science, Commerce, Arts, Health and Management, Marwadi Education Foundation proposed to establish "Marwadi University" in the Year 2016. Marwadi University bill was introduced and passed in Gujarat Assembly and Marwadi University was established under Gujarat Private Universities act no. 9 of 2016 on 9th May, 2016.

2. VISION & MISSION OF MARWADI UNIVERSITY

2.1 VISION OF THE UNIVERSITY

Our vision is to address challenges facing our society and planet through sterile education that builds capacity of our students and empower them through their innovative thinking practice and character building that will ultimately manifest to boost creativity and responsibility utilizing the limited natural resources to meet with the challenges of the 21st century

2.2 MISSION OF THE UNIVERSITY

- ✓ To produce creative, responsible and informed professionals.
- ✓ To produce individuals who are digital-age literates, inventive thinkers, effective communicators and highly productive.
- ✓ To deliver cost-effective quality education.
- ✓ To offer world-class, cross-disciplinary education in strategic sectors of economy though well devised and synchronized delivery structure and system, designed to tickle the creative intelligence and enhance the productivity of individuals.
- ✓ To provide a conducive environment that enables and promotes individuals to creatively interact, coordinate, disseminate and examine change, opinion as well as concept that will enable students to experience higher level of learning acquired through ceaseless effort that lead to the development of character, confidence, values and technical skills.

3. GREEN AUDIT

Modernization and industrialization are the two important outputs of the twentieth century that have made human life more luxurious and comfortable. They are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources, and finally making our mother Earth ugly and inhospitable. The time has come to wake up, unite and combat together for a sustainable environment.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, universities, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly university.

3.1 GOALS OF GREEN AUDIT

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To make sure that rules and regulations are taken care of to save environment.
- To avoid the interruptions in environment that are more difficult to handle and whose correction requires higher cost.
- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issues.

3.2 BENEFITS OF GREEN AUDIT

- It would help to protect the environment in and around the campus.
- Recognize the cost saving methods through waste minimization and management.
- Point out the prevailing and fourth coming impacts on environment.
- Recognize the cost-saving methods through waste minimizing and managing.
- Empower the organizations to frame a better environmental performance.
- Developing an environmental ethic and value systems in youngsters.
- It portrays a good image of an institution which helps building better relationships with the group of interested parties.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the University.

4. ENVIRONMENTAL POLICY OF THE UNIVERSITY

Marwadi University, Rajkot always believes in maintaining its own standard in matter of environment and quality consciousness. It has taken number of initiatives to protect its own environment with a pollution free campus.

To create a green cover, Eco-friendly atmosphere, pure oxygen at the university campus, a plantation program is organized every year with active participation from the university community and visitors. Green Audit Team owns responsibility to preserve the work carried out on the campus related to the environment.

This also helps in ensuring that the Environmental Policy is enacted, enforced, and reviewed using various environmental awareness programs.

ENVIRONMENTAL POLICY

Both the teaching and Non-teaching staff of Marwadi University Rajkot are committed for carrying out its activity for sustainable development. This we will achieve through the following :-

i. To educate students and staff on how to appropriately utilize water effectively.
ii. To put the campus' "Rain Water Harvesting" to use.
iii. To make the most of the solar energy generated by the solar panels on the roofs of educational buildings.
iv. To use ICT as much as possible while using paper as little as possible. It will contribute to the "Paperless Office" initiative.
v. Using vermin-compost on the campus to turn solid waste into fertiliser.
vi. To lessen the campus' noise pollution.
vii. To protect and nurture the Flora and Fauna on the campus
viii. To maintain green campus.
ix. To use treated waste water for flushing and gardening purpose.
x. To use recycle the waste material and make them usable.

5. CONSTITUTION FOR GREEN AUDIT

The Green Audit is carried out as per the environmental policy of the Green audit checklist. The aim of the audit is to check the existing practices and provide advice for the development of environmental policy and practice in the areas of:

- ✓ Waste management
- ✓ Management water conservation and management
- ✓ Tree plantations
- ✓ Bio-diversity and threatened/ endangered species
- ✓ Preservations Energy use and conservations
- ✓ Eco-friendly campus
- ✓ Green environment and clean campus

MEMBERS OF GREEN AUDIT TEAMS

Sr. No.	Name of Auditor	Designation
1	Dr. Tarak Vora	Team Leader
2	Dr. Abhishek Gupta	Member
3	Dr. Archana Sharma	Member
4	Dr. Nitinkumar Singh	Member
5	Dr. Hirendrasinh Padhiyar	Member
6	Mrs. Bhavna Thummar	Member
7	Mr. Raj Chapala	Member
8	Mr. Jyupil Joshi	Member
9	Mr. Devesh Poorey	Member
10	Mr. Kalpesh Chandarana	Member

6. OBJECTIVES OF THE STUDY

The green audit's primary goal is to support environmental management and conservation on college campuses. According to the relevant laws, rules, and standards, the audit's goal is to identify, measure, explain, and prioritise the framework for environmental sustainability. The following are the primary goals of doing a green audit:

- ✓ To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use on the campus.
- ✓ To establish a baseline data to assess future sustainability by avoiding the interruptions inenvironment that are more difficult to handle and their corrections requires high cost.
- ✓ To bring out a status report on environmental compliance

7. METHODOLOGY

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered thefollowing areas to summarise the present status of environment management in the campus

- **Water management**
  - ✓ Raw Water
  - ✓ Drinking Water
  - ✓ Waste Water
  - ✓ Sewage Water
  - ✓ Rain Strom Drain Water
- **Energy Conservation**
  - ✓ Petrol
  - ✓ Diesel
  - ✓ LPG
  - ✓ Electricity
- **Waste management**
  - ✓ Domestic waste management

8. FOCUS AREA OF AUDIT

To match with the objective of the green audit, following areas are kept under the scope of the audit.

1. Water management
2. Air Pollution Management
3. Noise Pollution Management
4. Green belt area & Bio-diversity

8.1 WATER MANAGEMENT

Water is a valuable natural resource for all living organisms. It is freely available depending on the climate and topographic features of a region. Water is a precious natural national resource available with a fixed quantum. The availability of water is decreasing due to the increasing population of the nation; as per capita availability of utilized water is going down.

Even though it is naturally present, drinking water that is portable is not easily available for human consumption. Just 3% of the water on our planet, which covers 70% of its surface, is fresh water. The world's 1.1 billion inhabitants are experiencing a water crisis. Water issue is greatly impacted by water pollution and waste. An alarming amount of water is being contaminated. Water contamination can cause a variety of illnesses or even death. Because of this, it's crucial to make sure that drinking water is sterile, clean, and free of germs and illnesses. Also, it's crucial to manage, protect, and conserve water resources so that they may be used sustainably. The use and quality of water on the university campus are being studied by our institution. Water auditing is done to assess raw water intake facilities and identify facilities for water treatment and reuse. The concerned auditor looks at the appropriate approach that may be used to balance the supply and demand for water.

USES AND MANAGEMENT

SOURCE OF WATER

Sr. No.	Resource	Quantity
1	GWI (Narmada Water)	-----
2	No of Open Well	02
3	No of Bore-well	03
4	Water reserve - Underground Tank	4 Lakhs

WATER USERS IN CAMPUS

Sr. No.	Person in different section	Strength (No. of person – Approx.)
1	Staff	400
2	Hostel Boarders	1360
3	Residential Family Members	54
4	Visitors	2000
5	Construction Labour	175

The visitors of the college vary with respect to different activities conducted in the college campus. During admission and different competitive exam conducted in the college campus. The total number of visitors of the university increases up to 2000 on such day.

WATER CONSUMPTION IN DIFFERENT ACTIVITYIN COLLEGE CAMPUS

Activity	Water used per activity (in Litter)	No. of times Activity performed in a day	Average water used Person/Day	No. of people using water	Total water consumption per Day
Hand and face wash	4-6 L	4	16-24L	1500	3000
Drinking Water	0.2-0.4L	6	1.2-2.4L	1500	2700
Toilet Flush	8-10L	4	32-40L	1500	54000
Bath	30-40 L	1	30-40 L	1500	52500
Cooking & Washing In resident	150-250L	2	300-500L	54	21600
Cooking Hostel	10-15L	4	40-60L	1500	75000
Total					235800

WATER QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : DRINKING WATER	
Test Report No / Ref.No. :- TA-121	**Date: 10-3-2018**
Name of Customer	Marwadi University, Rajkot
Address of Customer	Rajkot - Morbi Highway, Gauridad.
Environmental Condition	Ambient
Date of Sample Collection	5/3/2018
Nature of Sample	Colour: Colour less
Sample Quntitiy	100 ml
Packing Type	Plastic bottle
Type of Sampling	Grab
Sample Collected By	Mr. Kalpesh Parmar
Date of analysis starts	6/3/2018
Analysis conclude on	10/3/2018

Sr. No.	Parameters	Units	Test Method	Permissible Limit	Main Building A-Wing	Main Building B-Wing	PG Building	Law Building
1	**pH**	-	APHA 23rd Ed.,2017,4500-H+B	6.5 - 8.5	7.48	7.38	7.06	7.33
2	**TDS**	mg/L	APHA 23rd Ed. Method 2540-C	500	85.6	164	76	181
3	**Turbidity**	FNU	APHA 23rd Edition 2130-B(Page No.2-13)	1	0.49	0.44	0.52	0.83
4	**Conductivity**	µs/cm	APHA 23rd Ed. Titration Method 2510-B	200-800	208.6	328	202.4	362
5	**Chloride**	mg/L	APHA 23rd Ed 4500-Cl- B (Page No.4-75)	250	46	59	41	48
6	**Total Hardness**	mg/L	APHA 23rd Ed. Method 2510-B	200	68	108	64	152

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied, BDL= Below Detection Limit, MDL = Minimum Detection Limit
2. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
3. This office is not responsible for the authenticity for the samples not collected by our officials.
4. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
5. Permissible Limits: as per Schedule VI of EPA Rules-1986
*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

End of Report

Dr. Nitin Kumar Singh
Testing Incharge

Dr. Tarak Vora
Quality Manager

OBSERVATIONS IN REGARD OF WATER USAGES AND CONSERVATION PLAN

1. Treated water is used for flushing through dual plumbing system installed in all the buildings.
2. The garden is watered using sprinklers and drip irrigation system installed throughout the campus.
3. Drinking water quality is being tested regularly as per plan.
4. Rainwater harvesting is done in the lake created in the campus.

8.2 AIR POLLUTION MANAGEMENT

The university has consistently run programmes to raise staff, student, and societal awareness of the need to preserve and conserve the environment. Moreover, programmes and rallies on different environmental and health-related topics are organised in order to raise awareness. Students and professors at the university participate in NSS/NCC-related events, however the audit team was unable to locate any display boards promoting environmental conservation on the campus grounds.

A) MASS TRANSPORTATION FACILITY

As such campus is not generating any air pollution by its own activity except it has its own transportation department. Faculties and students of the university are motivated to use mass transportation system. Faculties are given some advantages for use of the bus facility provided by the university.

AIR QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : AMBIENT AIR	
Name of Customer	Marwadi University
Address of Customer	Rajkot - Morbi Highway, Gauridad.
Environmental Condition	Satisfactory
Date of Sample Collection	28-07-2017
Nature of Sample	Colour : Colour Less
Sample Collected By	Jyupil Joshi
Sample Tested By	Raj Chapala
Date of analysis starts	28-07-2017
Analysis conclude on	7/30/2017

Sr. No.	Parameters	Units	Test Method	Permissible Limit	MAIN BUILDING
1	PM_{10}	($\mu g/m^3$)	IS 5182 (Part 23) (1999, Reaffirmed 2010)	100	55.65
2	$PM_{2.5}$	($\mu g/m^3$)	NAAQMS/36/2012-13	60	19.45
3	SO_2	($\mu g/m^3$)	IS 5182 (Part 2)	80	1.34
4	NO_X	($\mu g/m^3$)	IS 5182 (Part 6)	80	1.87

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL = Minimum
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

Testing Incharge

Team Leader

8.3 NOISE POLLUTION MANAGEMENT

A) SILENCE ZONES IN THE UNIVERSITY

For awareness of the need to preserve silence at the institution, several display boards have been put up in the library and other locations.

B) NOISE CONTROL IN THE UNIVERSITY

The institution has enacted a no honking policy that forbids the use of any noise on campus, including honking.

On college campuses, noise pollution is maintained to a minimum and designated quiet zones are established in places like the library and classrooms.

NOISE LEVEL ASSESSMENT REPORT

ANALYSIS REPORT : NOISE			
Name of Customer		Marwadi University	
Address of Customer		Rajkot - Morbi Highway, Gauridad.	
Environmental Condition		Satisfactory	
Date of Sample Collection		01-12-2017	
Sr. No.	**Location**	**Permissible limit**	**Day (dB-A)**
1	**Main Gate**	65	63
2	**PG Building**		52
3	**Hostel Aera**		50
4	**Main Canteen**		54
5	**New Canteen**		55

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit

Testing Incharge

Team Leader

8.4 GREEN BELT AREA & BIO-DIVERSITY

The Green Belt Area is intended to preserve the environment and enhance the visual value of the college grounds. To guarantee that the structures adhere to green standards, the college's green area consists of the campus's vegetation, greenery, and sustainability. Also, by implementing various environmental awareness programmes, this aids in ensuring that the Environmental Policy is adopted, implemented, and evaluated.

OBSERVATIONS

The campus is close to over 40 different types (species) of flora and animals. Via the NSS unit, several tree planting initiatives are held during the months of July and August on college campuses and in the nearby communities. This initiative aids in promoting an eco-friendly atmosphere that gives the institute pure oxygen and raises awareness among the communities. The planting initiative comprises a variety of native decorative and therapeutic plants. The occurrence of similar species planted, such as "NEEM," is noted rather than sustaining biodiversity. Neem, Indian Blackberry Tree, Flame Tree, Mango Tree, Jack Fruit Tree, Teak, and Spanish Cherry Plant are the predominant species in the green belt.

9. EXECUTIVE SUMMARY & RECOMMENDATIONS

The university has created a green environmental policy and is working to promote sustainable growth on the campus. The university has created a team of academics and students that works to preserve biodiversity on the campus and contributes to efforts to reduce pollution in society. The university intends to add environmental management and protection to its curriculum. The university has given faculty and students workshops and trainings on environmental awareness.

RECOMMENDATIONS

1. Composting of bio degradable waste to be scientifically done
2. Water usage reduction techniques to be used
3. Tree plantation shall be done to maintain biodiversity as well as artificial nesting shall beinstalled.
4. D. G. stack monitoring/Exhaust gas analysis shall be done.
5. The Biodiversity is to be maintained while considering the plantation in future
6. The selection of trees species to be based on environmental conservation and carbon sequestration value

ANNEXURE I : LIST OF TREES & PLANTS SPOTTED IN & AROUND MU

A survey was carried out to find plant diversity in the campus of Marwadi University. The survey was focused on thediversity of plantsand treeson the basis of their classificationandeconomicimportance.

Species Type	Shrub	
Botanical Name	*Rauvolfia tetraphylla*	
Synonyms	*Rauvolfia canescens* L., *Rouvolfia tomentosa* Jacq., *Rauvolfia tetraphylla* L.	
Common Name	Bara Chand	
Family	Apocynaceae	
Local Names	• Gujarati : Sarpagandha	

Species Type	Shrub	
Botanical Name	*Mimosa pudica*	
Synonyms	Touch me not	
Common Name	Ail	
Family	Fabaceae - Mimosoideae	
Local Names	Gujarati : lajawni	

Species Type	Tree	
Botanical Name	*Bauhinia variegata*	
Synonyms	*Bauhinia candida* Roxb.	
Common Name	*Mountain ebony*, Kachnar	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kanchnar	
	• Sanskrit Kanchanar (white)	

Species Type	Tree	
BotanicalName	*Bixa orellana*	
Synonyms	*Bixa orellana* L.	
CommonName	Sindhuri	
Family	Bixaceae	
Local Names	• Marathi : Shenduri	

Species Type	Tree

Botanical Name	Butea monosperma	
Synonyms	*Butea frondosa* Koening ex Roxb., *Erythrina monosperma* Lam., *Butea monosperma* L.	
Common Name	Palas	
Family	Fabaceae-Papilionioideae	
Local Names	• Marathi : Palas, khakra	
	• Gujarati : Khaakhro	
	• Hindi : Palash	

Species Type	Tree	
Botanical Name	*Eucalytus globulus*	
Synonyms	*Eucalyptus gigantea* Dehn., *Eucalyptus glauca* DC., *Eucalyptus perfoliata* Desf., *Eucalyptus pulverulenta* Link	
Common Name	Australian gum Tree, Eucalyptus	
Family	Myrtaceae	
Local Names	• Marathi : Nilgiri	
	• Gujarati : Nilgiri	

Species Type	Tree

Botanical Name	*Nyctanthes arbo-tristis*	
Synonyms	*Bruschia macrocarpa* Bertol., *Nyctanthes arbor-tristis* var. dentata Hort.ex Moldenke, *Nyctanthes dentata* Blume, *Nyctanthes tristis* Salisb., Parilium arbor-tristis Gaertn., *Scabrita triflora* L.	
Common Name	Night jasmine, Harshingar	
Family	Nyctanthaceae	
Local Names	• Sanskrit : Parijata	
	• Gujarati : Paarijaat	

Species Type	Tree	
Botanical Name	*Peltophorum pterocarpum*	
Synonyms	*Caesalpinia gleniei* Thwaites, *Caesalpinia inermis* Roxb., Inga pterocarpa DC., *Peltophorum ferrugineum* (Decne) Benth., *Peltophorum inerme* (Roxb.) Llanos, *Peltophorum roxburghii* (G.Don) Degener, *Poiciana roxburghii* G.Don	
Common Name	Yellow gold mohur	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Taamraparni	

Species Type	Tree

Botanical Name	*Cocos nucifera*	
Common Name	Coconut palm	
Family	Arecaceae	
Local Names	• Marathi : Naral	
	• Gujarati :Nariyeli	

Species Type	Tree	
Botanical Name	*Ficus religiosa*	
Synonyms	Urostigma religiosum (L.) Gasparrini	
Common Name	Bot-Tree, Pipal	
Family	Moraceae	
Local Names	• Marathi : Pimpal	

Species Type	Tree

Botanical Name	*Mangifera indica* L.	
Synonyms	*Mangifera indica* L.	
Common Name	Aam	
Family	Ancardiaceae	
Local Names	• Marathi : Amba	

Species Type	Tree	
Botanical Name	*Murraya Koenigii*	
Synonyms	*Bergera koenigii* L., *Chalcas koenigii* (L.) Kurz, *Murraya foetidissima* Teijsm. & Binnend, *Murraya koenigii* (L.) Spreng	
Common Name	Indian curry leaf Tree, Mitha neem	
Family	Rutaceae	
Local Names	• Marathi : kadhi patta	
	• Gujarati: Mitho Limdo	

Species Type	Tree	
Botanical Name	*Saraca indica*	
Common Name	Asoka	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : ashok	
	• Gujarati : Ashok	

Species Type	Tree	
Botanical Name	*Tamarindus indica*	
Synonyms	*Tamarindus occidentalis* Gaertn., *Tamarindus officinalis* Hook.	
Common Name	Tamarind Tree, Imli	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Chinch	
	• Gujarati : Khaati Amli	

Species Type	Herb	
Botanical Name	*Aloe barbadensis*	
Synonyms	*Aloe abyssinica* Lam., *Aloe chinensis* Baker, *Aloe indica* Royle, *Aloe littoralis* Koenig ex Baker, *Aloe vera* (L.) Burm.f., *Aloe vulgaris* Lam., *Alpinia allhugas* Roscoe, *Aloe barbadensis* Mill.	
Common Name	Aloe	
Family	Liliaceae	
Local Names	• Marathi :Korphad	
	• Gujarati : Ghrutakumari	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	*Senna occidentalis* (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Kaasundro	

Species Type	Herb	
Botanical Name	*Catharanthus roseus*	
Synonyms	*Lochnera rosea* (L.) Reichb., *Vinca rosea* L.*, Catharanthus roseus* (L.) G. Don	
Common Name	Sadabahar	
Family	Apocynaceae	
Local Names	• Marathi : Sadaphuli	

Species Type	Herb	
Botanical Name	*Cymbopogon citratus*	
Synonyms	*Andropogon citratus* DC., *Cymbopogon citratus* (DC.) Stapf	
Common Name	Lemon grass, Gandh-ghas	
Family	Poaceae	
Local Names	• Gujarati : Lili-cha	

Species Type	Herb	
Botanical Name	*Elettaria cardamomum*	
Common Name	Elaichi	
Family	Scitaminaceae	
Local Names	• Marathi : elaichi	

Species Type	Herb	
Botanical Name	*Mentha piperita*	
Common Name	Peppermint	
Family	Lamiaceae	
Local Names	• Marathi : Pudina	
	• Gujarati : Pudino	

Species Type	Herb	
Botanical Name	*Mimosa pudica*	
Synonyms	*Mimosa pudica L*.	
Common Name	Touch-me-not	
Family	Fabaceae-Mimosoideae	
Local Names	• Marathi : Lajwanti	
	• Gujarati : Lajaamni	

Species Type	Herb	
Botanical Name	*Ocimum basilicum*	
Common Name	Babui tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Sabja, tulas	
	• Gujarati : Damro	

Species Type	Herb	
Botanical Name	*Ocimum sanctum*	
Synonyms	*Ocimum inodurum* Burm.	
Common Name	Tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Krishna Tulas	
	• Gujarati : Vishnu Tulsi	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : isabgula	

Species Type	Herb	
Botanical Name	*Rauvolfia serpentina*	
Synonyms	*Ophioxylon album* Gaertn., *Ophioxylon serpentium* L., *Ophioxylon trifoliatum* Gaertn., *Rauvolfia trifoliata* (Gaertn.) Baill., *Rauvolfia serpentina* (L.) Benth. ex Kurz	
Common Name	Sarpagandha, chota chand	
Family	Apocynaceae	
Local Names	• Marathi : Sarpagandha	
	• Sanskrit: Sarpagandha	

Species Type	Herb	
BotanicalName	*Solanum surattense*	
Synonyms	*Solanum mccanni* Sant., *Solanum xanthocarpum* Schrad. & Wendl.	
CommonName	Kantakari, Kateli	
Family	Solanaceae	
Local Names	• Gujarati : Kantkari	

Species Type	Herb	
Botanical Name	*Swertia chirata*	
Common Name	Kiryata	
Family	Gentianaceae	
Local Names	• Gujarati : chirata	

Species Type	Herbs	
Botanical Name	*Zingiber officeinale*	
Common Name	Adrak	
Family	Zingiberaceae	
Local Names	• Marathi : Adrak	
	• Gujarati : adu	

Species Type	*Shrub*	
Botanical Name	*Withania somnifera*	
Synonyms	*Physalis flexuosa* L., *Physalis somnifera* L., *Withania somnifera* (L.) Dunal.	
Common Name	Ashwagandha	
Family	Solanaceae	
Local Names	• Marathi : Ashwagandha	
	• Gujarati : Ashwagandha	

Species Type	*Herb*	
Botanical Name	Kalanchoe pinnata	
Synonyms	• Bryophyllum pinnatum (Lam.) Oken. • Bryophyllum calycinum Salisb. • Cotyledon pinnata Lam.	
Family	Crassulaceae	
Local Names	• Gujarati : patthar-chatti	
	• Sanskrit :	

Species Type	Climber	
Botanical Name	*Asparagus racemosus*	
Synonyms	*Asparagus racemosus* Willd	
Common Name	Satavari	
Family	Liliaceae	
Local Names	• Marathi : Shatavari	
	• Gujarati : Shatavari	

Species Type	Shrub	
Botanical Name	*Adhatoda vasica*	
Synonyms	*Adhatoda vasica* Nees	
Common Name	Malabar nut	
Family	Acanthaceae	
Local Names	• Marathi :	
	• Gujarati :	

Species Type	Tree	
Botanical Name	*Pongamia pinnata*	
Common Name	Indian beach	
Family	Fabaceae-Papilionioideae	
Local Names	• Marathi : Karanj	
	• Gujarati : Karanj	

Species Type	Climber	
Botanical Name	*Tylophora indica*	
Synonyms	*Asclepias asthmatica* L. f., *Cynanchum bracteatum* Thunb., *C. indicum* Burm. f., Hoya hirsuta Moon. *Tylophora asthmatica* (L.f.) Wight & Arn.	
Common Name	Indian ipecacuanha	
Family	Asclepiadaceae	
Local Names	• Marathi : Damvel	
	• Gujarati : Damvel	

Species Type	Climber	
Botanical Name	*Piper longum*	
Synonyms	*Chavica roxburghii* Miq., *Piper longum* L.	
Common Name	Indian long pepper, Pipal	
Family	Piperaceae	
Local Names	• Marathi : Lendi pimpli	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Bacopa monnieri*	
Synonyms	*Bacopa monnieria* (L.) Wettst., *Gratiola monnieria* L., *Herpestis monniera* Benth., *Herpestis monnieria* (L.) HBK., *Lysimachia monnieri* L., *Moniera cuneifolia* Michx.	
Common Name	Thyme-leaved Gratiola , Jal Brahmi	
Family	Scrophulariaceae	
Local Names	• sanskruit : Brahmi	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Eclipta alba*	
Common Name	Bhangra	
Family	Asteraceae	
Local Names	• sanskruit : Bhrungaraj	
	• Gujarati : Bhaangro	
	• Hindi : Bhringraj	
	• Marathi : Maka (White)	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : Isabgol	

Species Type	Climber
Botanical Name	*Mucuna pruriens* 
Synonyms	*Carpopogon niveum* Roxb., *Carpopogon pruriens* Roxb., *Dolichos pruriens* L., *Mucuna nivea* (Roxb.) DC., *Mucuna prurita* Hook., *Stizolobium pruriens* (L.) Medikus
Common Name	Kawach
Family	Fabaceae
Local Names	• Marathi : Khaj-kujli - Black
	• Gujarati : Kaucha

Species Type	Herb
Botanical Name	*Trachyspermum ammi* 
Common Name	Carum Ajwain
Family	Apiaceae
Local Names	• Marathi : Owaa
	• Gujarati : Kaucha

Species Type	Tree	
BotanicalName	*Punica granatum*	
Synonyms	*Punica granatum* L.	
CommonName	Anar	
Family	Lythraceae	
Local Names	• Marathi : Dalimb	
	• Gujarati : Daadam	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	Senna occidentalis (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kaasundro	
	• Gujarati : Kaasundro	

ANNEXURE-II : LIST OF BIRDS SPOTTED IN & AROUND MU

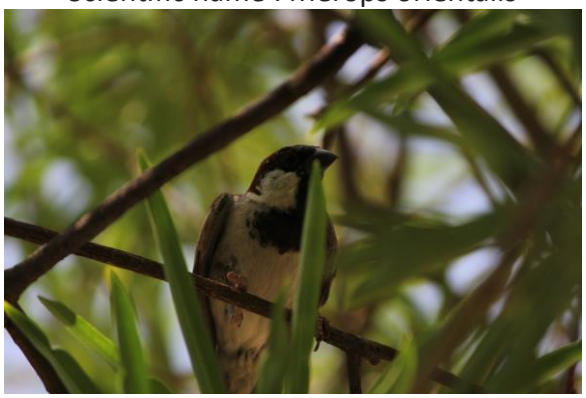
A survey was carried out to find the animal diversity in the campus of Marwadi University Rajkot. The survey focused on the diversity of birds, butterfly, Amphibia.

Common name: Purple sunbird
Scientific name : Cinnyris asiaticus

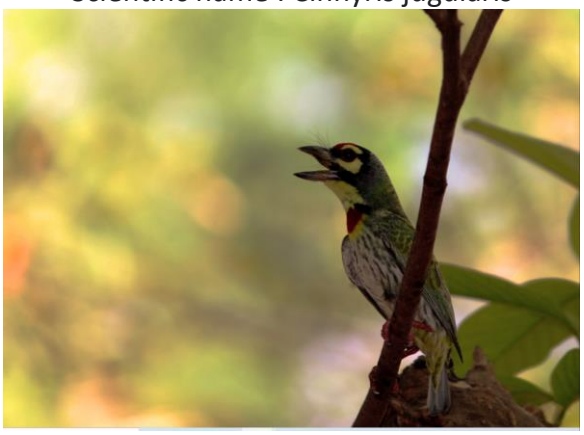
Common name: Common tailorbird
Scientific name : Orthotomus sutorius

Common name: Asian green bee-eater
Scientific name : Merops orientalis

Common name: olive-backed sunbird
Scientific name : Cinnyris jugularis



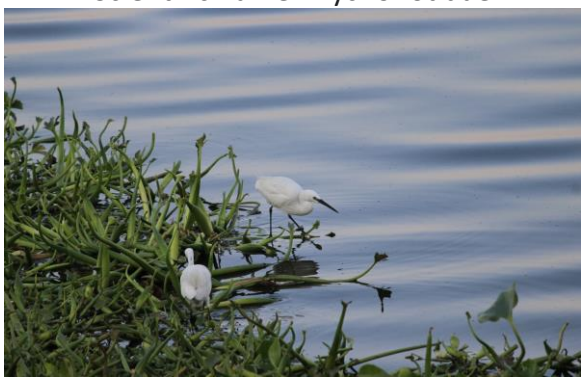
Common name: house sparrow
Scientific name : Passer domesticus



Common name: coppersmith barbet
Scientific name : Psilopogon haemacephalus

Common name: Bulbul
Scientific name : Pycnonotidae

Common name: laughing dove
Scientific name : Streptopelia senegalensis



Common name: Little egret
Scientific name : Egretta garzetta

Common name: Oriental darter
Scientific name : Anhinga melanogaster

Common name: Painted stork
Scientific name : Mycteria leucocephala

Common name:
Scientific name :

Common name: billed pelican
Scientific name : Pelecanus philippensis

Common name: Parrots
Scientific name : Psittaciformes

Common name: Robber flies
Scientific name : Asilidae

Common name: Dragonfly
Scientific name : Anisoptera

Common name:
Scientific name :

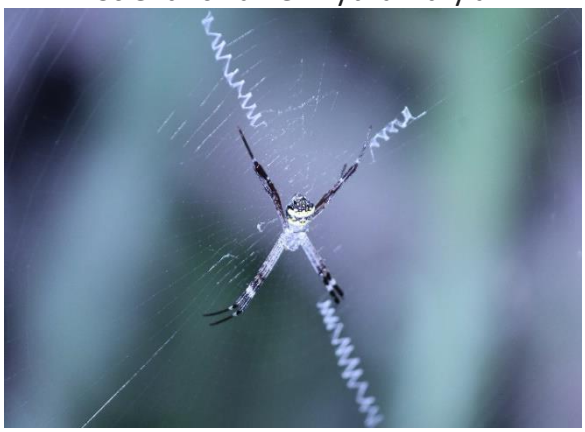
Common name:California sister
Scientific name :Adelpha bredowii

Common name:
Scientific name :

Common name: common tiger
Scientific name : Danaus genutia

Common name: Spotted Joker
Scientific name : Byblia ilithyia

Common name: Blue tiger
Scientific name : Tirumala limniace



Common name: Signature Spider
Scientific name : Argiope anasuja

Common name: button spider
Scientific name : Latrodectus umbukwane

ANNEXURE-III : LIST OF RAPTILES SPOTTED IN & AROUND MU

Scientific name: Rattus rattus
Common Name : House Rat

Scientific name: Calotes versicolor Common Name : Indian Garden Lizard

Scientific name: Hoplobatrachus tigerinus
Common Name : Indian Bull Frog

Scientific name: Naja naja
Common Name : Indian Cobra

Marwadi University
Marwadi Chandarana Group

GREEN AUDIT REPORT

2018-2019

Marwadi University

Rajkot-Morbi Road, Rajkot – 360003
Gujarat, India

Submitted By

Green Audit Team

TABLE OF CONTENTS

ACKNOWLEDGEMENT

Green Audit Assessment Team thanks to the Dean, Marwadi University, Rajkot for assigning the task of Green Audit of the university campus to us. We appreciate the cooperation that we got from all the faculties and students during the entire process. Our special thanks to Prof. (Dr.) Yogesh Kosta, Provost and Shri Naresh Jadeja, Registrar of the university for their warm support and encouragement from the very beginning till the end of the process.

The entire team is very grateful to the management of Marwadi University for their continuous support and motivation to take various innovative and challenging assignments.

Dr. Tarak Vora
Team Leader
Green Audit Team
Marwadi University. Rajkot

DISCLAIMER

Green Audit Team Has prepare this report on the basis of primary data collected from the different areas of the university. All reasonable care has been takesn in its preparation: details contained in this reprort have been compiled in good faith based on information gathered.

Date: 25/03/2019

Prepared by:
Green Audit Team

1. BRIEF ABOUT MARWADI UNIVERSITY

In 2007-08 the availability of world class academic facilities in the Saurashtra region were sparse; which encouraged Marwadi Group, Rajkot to launch Marwadi Education Foundation's Group of Institutes, offering Technical and Professional UG & PG courses and programs such as B.E, MBA and MCA. Marwadi Education Foundation's Group of Institutions (MEFGI) was incepted as a major organ of Marwadi Education Foundation's Group of Institutions in 2008, under the Bombay Public Trust Act 1950. Marwadi Education Foundation's Group of Institutions is a body promoted by Marwadi Shares & Finance Limited; a major stock broking company in India & Chandarana Intermediaries Brokers Pvt. Ltd. Since its inception Marwadi Education Foundation's Group of Institutions were affiliated with Gujarat Technological University.

Commitment to provide best and industry relevant education received an overwhelming trust from the society and in order to blend Engineering with Science and support them through Management and Law disciplines and have multi disciplinary course offerings in Science, Commerce, Arts, Health and Management, Marwadi Education Foundation proposed to establish "Marwadi University" in the Year 2016. Marwadi University bill was introduced and passed in Gujarat Assembly and Marwadi University was established under Gujarat Private Universities act no. 9 of 2016 on 9th May, 2016.

2. VISION & MISSION OF MARWADI UNIVERSITY

2.1 VISION OF THE UNIVERSITY

Our vision is to address challenges facing our society and planet through sterile education that builds capacity of our students and empower them through their innovative thinking practice and character building that will ultimately manifest to boost creativity and responsibility utilizing the limited natural resources to meet with the challenges of the 21st century

2.2 MISSION OF THE UNIVERSITY

- ✓ To produce creative, responsible and informed professionals.
- ✓ To produce individuals who are digital-age literates, inventive thinkers, effective communicators and highly productive.
- ✓ To deliver cost-effective quality education.
- ✓ To offer world-class, cross-disciplinary education in strategic sectors of economy though well devised and synchronized delivery structure and system, designed to tickle the creative intelligence and enhance the productivity of individuals.
- ✓ To provide a conducive environment that enables and promotes individuals to creatively interact, coordinate, disseminate and examine change, opinion as well as concept that will enable students to experience higher level of learning acquired through ceaseless effort that lead to the development of character, confidence, values and technical skills.

3. GREEN AUDIT

Modernization and industrialization are the two important outputs of the twentieth century that have made human life more luxurious and comfortable. They are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources, and finally making our mother Earth ugly and inhospitable. The time has come to wake up, unite and combat together for a sustainable environment.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, universities, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly university.

3.1 GOALS OF GREEN AUDIT

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To make sure that rules and regulations are taken care of to save environment.
- To avoid the interruptions in environment that are more difficult to handle and whose correction requires higher cost.
- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issues.

3.2 BENEFITS OF GREEN AUDIT

- It would help to protect the environment in and around the campus.
- Recognize the cost saving methods through waste minimization and management.
- Point out the prevailing and fourth coming impacts on environment.
- Recognize the cost-saving methods through waste minimizing and managing.
- Empower the organizations to frame a better environmental performance.
- Developing an environmental ethic and value systems in youngsters.
- It portrays a good image of an institution which helps building better relationships with the group of interested parties.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the University.

4. ENVIRONMENTAL POLICY OF THE UNIVERSITY

Marwadi University, Rajkot always believes in maintaining its own standard in matter of environment and quality consciousness. It has taken number of initiatives to protect its own environment with a pollution free campus.

To create a green cover, Eco-friendly atmosphere, pure oxygen at the university campus, a plantation program is organized every year with active participation from the university community and visitors. Green Audit Team owns responsibility to preserve the work carried out on the campus related to the environment.

This also helps in ensuring that the Environmental Policy is enacted, enforced, and reviewed using various environmental awareness programs.

ENVIRONMENTAL POLICY

Both the teaching and Non-teaching staff of Marwadi University Rajkot are committed for carrying out its activity for sustainable development. This we will achieve through the following :-

i. To educate students and staff on how to appropriately utilize water effectively.
ii. To put the campus' "Rain Water Harvesting" to use.
iii. To make the most of the solar energy generated by the solar panels on the roofs of educational buildings.
iv. To use ICT as much as possible while using paper as little as possible. It will contribute to the "Paperless Office" initiative.
v. Using vermin-compost on the campus to turn solid waste into fertiliser.
vi. To lessen the campus' noise pollution.
vii. To protect and nurture the Flora and Fauna on the campus
viii. To maintain green campus.
ix. To use treated waste water for flushing and gardening purpose.
x. To use recycle the waste material and make them usable.

5. CONSTITUTION FOR GREEN AUDIT

The Green Audit is carried out as per the environmental policy of the Green audit checklist. The aim of the audit is to check the existing practices and provide advice for the development of environmental policy and practice in the areas of:

- ✓ Waste management
- ✓ Management water conservation and management
- ✓ Tree plantations
- ✓ Bio-diversity and threatened/ endangered species
- ✓ Preservations Energy use and conservations
- ✓ Eco-friendly campus
- ✓ Green environment and clean campus

MEMBERS OF GREEN AUDIT TEAMS

Sr. No.	Name of Auditor	Designation
1	Dr. Tarak Vora	Team Leader
2	Dr. Abhishek Gupta	Member
3	Dr. Archana Sharma	Member
4	Dr. Nitinkumar Singh	Member
5	Dr. Hirendrasinh Padhiyar	Member
6	Mrs. Bhavna Thummar	Member
7	Mr. Raj Chapala	Member
8	Mr. Jyupil Joshi	Member
9	Mr. Devesh Poorey	Member
10	Mr. Kalpesh Chandarana	Member

6. OBJECTIVES OF THE STUDY

The green audit's primary goal is to support environmental management and conservation on college campuses. According to the relevant laws, rules, and standards, the audit's goal is to identify, measure, explain, and prioritise the framework for environmental sustainability. The following are the primary goals of doing a green audit:

- ✓ To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use on the campus.
- ✓ To establish a baseline data to assess future sustainability by avoiding the interruptions inenvironment that are more difficult to handle and their corrections requires high cost.
- ✓ To bring out a status report on environmental compliance

7. METHODOLOGY

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered thefollowing areas to summarise the present status of environment management in the campus

➢ Water management

- ✓ Raw Water
- ✓ Drinking Water
- ✓ Waste Water
- ✓ Sewage Water
- ✓ Rain Strom Drain Water

➢ Energy Conservation

- ✓ Petrol
- ✓ Diesel
- ✓ LPG
- ✓ Electricity

➢ Waste management

- ✓ Domestic waste management

8. FOCUS AREA OF AUDIT

To match with the objective of the green audit, following areas are kept under the scope of the audit.

1. Water management
2. Air Pollution Management
3. Noise Pollution Management
4. Green belt area & Bio-diversity

8.1 WATER MANAGEMENT

Water is a valuable natural resource for all living organisms. It is freely available depending on the climate and topographic features of a region. Water is a precious natural national resource available with a fixed quantum. The availability of water is decreasing due to the increasing population of the nation; as per capita availability of utilized water is going down.

Even though it is naturally present, drinking water that is portable is not easily available for human consumption. Just 3% of the water on our planet, which covers 70% of its surface, is fresh water. The world's 1.1 billion inhabitants are experiencing a water crisis. Water issue is greatly impacted by water pollution and waste. An alarming amount of water is being contaminated. Water contamination can cause a variety of illnesses or even death. Because of this, it's crucial to make sure that drinking water is sterile, clean, and free of germs and illnesses. Also, it's crucial to manage, protect, and conserve water resources so that they may be used sustainably. The use and quality of water on the university campus are being studied by our institution. Water auditing is done to assess raw water intake facilities and identify facilities for water treatment and reuse. The concerned auditor looks at the appropriate approach that may be used to balance the supply and demand for water.

USES AND MANAGEMENT

SOURCE OF WATER

Sr. No.	Resource	Quantity
1	GWI (Narmada Water)	-----
2	No of Open Well	02
3	No of Bore-well	03
4	Water reserve - Underground Tank	4 Lakhs

WATER USERS IN CAMPUS

Sr. No.	Person in different section	Strength (No. of person – Approx.)
1	Staff	410
2	Hostel Boarders	1400
3	Residential Family Members	50
4	Visitors	2000
5	Construction Labour	150

The visitors of the college vary with respect to different activities conducted in the college campus. During admission and different competitive exam conducted in the college campus. The total number of visitors of the university increases up to 2000 on such day.

WATER CONSUMPTION IN DIFFERENT ACTIVITYIN COLLEGE CAMPUS

Activity	Water used per activity (in Litter)	No. of times Activity performed in a day	Average water used Person/Day	No. of people using water	Total water consumption per Day
Hand and face wash	4-6 L	4	16-24L	1500	3000
Drinking Water	0.2-0.4L	6	1.2-2.4L	1500	2700
Toilet Flush	8-10L	4	32-40L	1500	54000
Bath	30-40 L	1	30-40 L	1500	52500
Cooking & Washing In resident	150-250L	2	300-500L	54	21600
Cooking Hostel	10-15L	4	40-60L	1500	75000
Total					235800

WATER QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : DRINKING WATER								
Test Report No / Ref.No. :- TA-172							**Date: 10-9-2018**	
Name of Customer	Marwadi University, Rajkot							
Address of Customer	Rajkot - Morbi Highway, Gauridad.							
Environmental Condition	Ambient							
Date of Sample Collection	5/3/2018							
Nature of Sample	Colour: Colour less							
Sample Quntitiy	100 ml							
Packing Type	Plastic bottle							
Type of Sampling	Grab							
Sample Collected By	Mr. Kalpesh Parmar							
Date of analysis starts	6/9/2018							
Analysis conclude on	10/9/2018							
Sr. No.	**Parameters**	**Units**	**Test Method**	**Permissible Limit**	**Main Building A-Wing**	**Main Building B-Wing**	**PG Building**	**Law Building**
1	**pH**	-	APHA 23rd Ed.,2017,4500-H+B	6.5 - 8.5	7.82	7.25	7.08	7.22
2	**TDS**	mg/L	APHA 23rd Ed. Method 2540-C	500	48	122	125	128
3	**Turbidity**	FNU	APHA 23rd Edition 2130-B(Page No.2-13)	1	0.89	0.56	0.88	0.78
4	**Conductivity**	µs/cm	APHA 23rd Ed. Titration Method 2510-B	200-800	222	352	333.5	387
5	**Chloride**	mg/L	APHA 23rd Ed 4500-Cl- B (Page No.4-75)	250	78	85	49	85
6	**Total Hardness**	mg/L	APHA 23rd Ed. Method 2510-B	200	88	101	58	188

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL = Minimum Detection Limit
2. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
3. This office is not responsible for the authenticity for the samples not collected by our officials.
4. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
5. Permissible Limits: as per Schedule VI of EPA Rules-1986
*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

End of Report

Dr. Nitin Kumar Singh
Testing Incharge

Dr. Tarak Vora
Quality Manager

OBSERVATIONS IN REGARD OF WATER USAGES AND CONSERVATION PLAN

1. Treated water is used for flushing through dual plumbing system installed in all the buildings.
2. The garden is watered using sprinklers and drip irrigation system installed throughout the campus.
3. Drinking water quality is being tested regularly as per plan.
4. Law flow water fixtures are installed in bathroom and toilets.
5. Rainwater harvesting is done in the lake created in the campus.

8.2 AIR POLLUTION MANAGEMENT

The university has consistently run programmes to raise staff, student, and societal awareness of the need to preserve and conserve the environment. Moreover, programmes and rallies on different environmental and health-related topics are organised in order to raise awareness. Students and professors at the university participate in NSS/NCC-related events.

A) MASS TRANSPORTATION FACILITY

As such campus is not generating any air pollution by its own activity except it has its own transportation department. Faculties and students of the university are motivated to use mass transportation system. Faculties are given some advantages for use of the bus facility provided by the university.

AIR QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : AMBIENT AIR	
Name of Customer	Marwadi University
Address of Customer	Rajkot - Morbi Highway, Gauridad.
Environmental Condition	Satisfactory
Date of Sample Collection	29-08-2018
Nature of Sample	Colour : Colour Less
Sample Collected By	Jyupil Joshi
Sample Tested By	Raj Chapala
Date of analysis starts	30-08-2018
Analysis conclude on	9/1/2018

Sr. No.	Parameters	Units	Test Method	Permissible Limit	MAIN BUILDING
1	PM_{10}	($\mu g/m^3$)	IS 5182 (Part 23) (1999, Reaffirmed 2010)	100	52.47
2	$PM_{2.5}$	($\mu g/m^3$)	NAAQMS/36/2012-13	60	24.36
3	SO_2	($\mu g/m^3$)	IS 5182 (Part 2)	80	1.51
4	NO_X	($\mu g/m^3$)	IS 5182 (Part 6)	80	2.15

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL = Minimum
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986
*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

Testing Incharge

Team Leader

STACK EMISSION ASSESSMENT REPORT

ANALYSIS REPORT : STACK : DG SET					
Test Report No / Ref.No. :- TA-167					**Date:- 15-08-2018**
Name of Customer	Marwadi University, Rajkot				
Address of Customer	Rajkot - Morbi Highway, Gauridad.				
Temperature	31°C				
Weather Condition	Satisfactory				
Date of Sample Collection	14-08-2018				
Nature of Sample	Colour : Colour Less				
Sample Collected By	Dr. Tarak Vora, Mr. Jitesh Joshi & Mr. Jyupil Joshi				
Date of analysis starts	14-08-2018				
Analysis conclude on	15-08-2018				
Sr. No.	**Parameters**	**Units**	**Test Method**	**Permissible Limit**	**DG Set**
				Stack Height In Meter	**10**
1	**PM**	mg/Nm^3	IS 11255 (Part 1)	150	37.84
2	**SO_2**	ppm	IS 11255 (Part 2)	100	17.21
3	**NO_x**	ppm	IS 11255 (Part 7)	50	26.76

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit

End of Report

Dr. Nitin Kumar Singh
Testing Incharge

Dr. Tarak Vora
Quality Manager

8.3 NOISE POLLUTION MANAGEMENT

A) SILENCE ZONES IN THE UNIVERSITY

For awareness of the need to preserve silence at the institution, several display boards have been put up in the library and other locations.

B) NOISE CONTROL IN THE UNIVERSITY

The institution has enacted a no honking policy that forbids the use of any noise on campus, including honking.

On college campuses, noise pollution is maintained to a minimum and designated quiet zones are established in places like the library and classrooms.

C) DG SET FOR POWER BACK-UP

Every time there is a power outage because of load shedding or maintenance on the college campus, the college uses its DG backup system. Noise monitoring of the stack of DG set is being done on regular basis.

NOISE LEVEL ASSESSMENT REPORT

ANALYSIS REPORT : NOISE			
Name of Customer		Marwadi University	
Address of Customer		Rajkot - Morbi Highway, Gauridad.	
Environmental Condition		Satisfactory	
Date of Sample Collection		02-12-2018	
Sr. No.	**Location**	**Permissible limit**	**Day (dB-A)**
1	**Main Gate**	65	63
2	**PG Building**		56
3	**Hostel Aera**		58
4	**Main Canteen**		57
5	**New Canteen**		50

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit

Testing Incharge

Team Leader

8.4 GREEN BELT AREA & BIO-DIVERSITY

The Green Belt Area is intended to preserve the environment and enhance the visual value of the college grounds. To guarantee that the structures adhere to green standards, the college's green area consists of the campus's vegetation, greenery, and sustainability. Also, by implementing various environmental awareness programmes, this aids in ensuring that the Environmental Policy is adopted, implemented, and evaluated.

OBSERVATIONS

The campus is close to over 45 different types (species) of flora and animals. Via the NSS unit, several tree planting initiatives are held during the months of July and August on college campuses and in the nearby communities. This initiative aids in promoting an eco-friendly atmosphere that gives the institute pure oxygen and raises awareness among the communities. The planting initiative comprises a variety of native decorative and therapeutic plants. The occurrence of similar species planted, such as "NEEM," is noted rather than sustaining biodiversity. Neem, Indian Blackberry Tree, Flame Tree, Mango Tree, Jack Fruit Tree, Teak, and Spanish Cherry Plant are the predominant species in the green belt.

9. EXECUTIVE SUMMERY & RECOMMENDATIONS

The university has created a green environmental policy and is working to promote sustainable growth on the campus. The university has created a team of academics and students that works to preserve biodiversity on the campus and contributes to efforts to reduce pollution in society. The university intends to add environmental management and protection to its curriculum. The university has given faculty and students workshops and trainings on environmental awareness. Law flow water fixures are installed in the campus.

It is also verified that the initiatives on almost all the recommendations of the previous year have been taken by the university which are found satisfactory.

RECOMMENDATIONS

1. Composting of bio degradable waste to be scientifically done.
2. World Environment Day to be celebrated in college premises every year on 5th June and whole college students and staff shall get involved and take OATH for ENVIRONMENT.
3. Use of bicycle in campus to be promoted.
4. Energy saving awareness shall be done by displaying the boards at appropriate place.
5. To use Common or public Vehicle instead individual vehicle to conserve fossil fuel.
6. Watering schedule to be planned according the season.
7. Additional energy meters to be placed to track water and energy usage by building and department.
8. Analyze treated water of STP on regular basis.
9. To have waste management system in place.

ANNEXURE I : LIST OF TREES & PLANTS SPOTTED IN & AROUND MU

A survey was carried out to find plant diversity in the campus of Marwadi University. The survey was focused on the diversity of plants and trees on the basis of their classification and economic importance.

Species Type	Tree	
Botanical Name	*Bauhinia purpurea*	
Common Name	Butterfly Tree, geranium Tree	
Family	Fabaceae Caesalpinioideae	
Local Names	• Gujarati: Hadayparni	
	• Sanskrit : Kanchanar (red)	

Species Type	Tree	
Botanical Name	Azadirachta indica	
Synonyms	*Antelaea indica* (L.) Adelb., *Melia azadirachta* L., *Melia indica* (A. Juss.) Brandis	
Common Name	Neem	
Family	Meliaceae	
Local Names	• Hindi :	Neem
	• Gujarati :	Limbado , Kadavo Limbado
	• Sanskrit :	Nimba

Species Type	Tree	
Botanical Name	Khaya senegalensis	
Common Name	Senegal Mahogany, African Mahogany, Senegal Khaya	
Family	Meliaceae	
Local Name	• Gujarati: Khaya	

Species Type	Tree	
Botanical Name	Spathodea campanulata	
Common Name	*African tulip tree*	
Family	Bignoniaceae	
Local Names	• Gujarati: Tulip tree	

Species Type	Tree	
Botanical Name	Samanea saman	
Common Name	Saman,Pukul Lima, Cow Tamarind, Hujan-Hujan, East Indian Walnut, Monkey, rain tree	
Family	Fabaceae (alt. Mimosaceae), legume family	
Local Names	• Gujarati: *Shirish,*	
	• Sanskrit :*Shiriisha*	

Species Type	Tree	
Botanical Name	*Terminalia mantaly*	
Common Name	Madagascar Almond, Umbrella Tree	
Family	Combretaceae	
Local Names	• Gujarati: African tree	

Species Type	Shrub
Botanical Name	*Rauvolfia tetraphylla* 
Synonyms	*Rauvolfia canescens* L., *Rouvolfia tomentosa* Jacq., *Rauvolfia tetraphylla* L.
Common Name	Bara Chand
Family	Apocynaceae
Local Names	• Gujarati : Sarpagandha

Species Type	Shrub
Botanical Name	*Mimosa pudica* 
Synonyms	Touch me not
Common Name	Ail
Family	Fabaceae - Mimosoideae
Local Names	Gujarati : lajawni

Species Type	Tree	
Botanical Name	*Bauhinia variegata*	
Synonyms	*Bauhinia candida* Roxb.	
Common Name	*Mountain ebony*, Kachnar	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kanchnar	
	• Sanskrit Kanchanar (white)	

Species Type	Tree	
BotanicalName	*Bixa orellana*	
Synonyms	*Bixa orellana* L.	
CommonName	Sindhuri	
Family	Bixaceae	
Local Names	• Marathi : Shenduri	

Species Type		Tree
Botanical Name		Butea mon
Synonyms		*Butea fron* *monosperm*
Common Name		Palas
Family		Fabaceae-I
Local Names	•	• Marathi
	•	• Gujarati
	•	• Hindi

Species Type	Tree	
Botanical Name	*Eucalytus globulus*	
Synonyms	*Eucalyptus gigantea* Dehn., *Eucalyptus glauca* DC., *Eucalyptus perfoliata* Desf., *Eucalyptus pulverulenta* Link	
Common Name	Australian gum Tree, Eucalyptus	
Family	Myrtaceae	
Local Names	• Marathi : Nilgiri	
	• Gujarati : Nilgiri	

Species Type	Tree	
Botanical Name	*Nyctanthes arbo-tristis*	
Synonyms	*Bruschia macrocarpa* Bertol., *Nyctanthes arbor-tristis* var. dentata Hort.ex Moldenke, *Nyctanthes dentata* Blume, *Nyctanthes tristis* Salisb., Parilium arbor-tristis Gaertn., *Scabrita triflora* L.	
Common Name	Night jasmine, Harshingar	
Family	Nyctanthaceae	
Local Names	• Sanskrit : Parijata	
	• Gujarati : Paarijaat	

Species Type	Tree	
Botanical Name	*Peltophorum pterocarpum*	
Synonyms	*Caesalpinia gleniei* Thwaites, *Caesalpinia inermis* Roxb., Inga pterocarpa DC., *Peltophorum ferrugineum* (Decne) Benth., *Peltophorum inerme* (Roxb.) Llanos, *Peltophorum roxburghii* (G.Don) Degener, *Poiciana roxburghii* G.Don	
Common Name	Yellow gold mohur	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Taamraparni	

Species Type	Tree	
Botanical Name	*Cocos nucifera*	
Common Name	Coconut palm	
Family	Arecaceae	
Local Names	• Marathi : Naral	
	• Gujarati :Nariyeli	

Species Type	Tree	
Botanical Name	*Ficus religiosa*	
Synonyms	Urostigma religiosum (L.) Gasparrini	
Common Name	Bot-Tree, Pipal	
Family	Moraceae	
Local Names	• Marathi : Pimpal	

Species Type	Tree	
Botanical Name	*Mangifera indica* L.	
Synonyms	*Mangifera indica* L.	
Common Name	Aam	
Family	Ancardiaceae	
Local Names	• Marathi : Amba	

Species Type	Tree	
Botanical Name	*Murraya Koenigii*	
Synonyms	*Bergera koenigii* L., *Chalcas koenigii* (L.) Kurz, *Murraya foetidissima* Teijsm. & Binnend, *Murraya koenigii* (L.) Spreng	
Common Name	Indian curry leaf Tree, Mitha neem	
Family	Rutaceae	
Local Names	• Marathi : kadhi patta	
	• Gujarati: Mitho Limdo	

Species Type	Tree	
Botanical Name	*Saraca indica*	
Common Name	Asoka	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : ashok	
	• Gujarati : Ashok	

Species Type	Tree	
Botanical Name	*Tamarindus indica*	
Synonyms	*Tamarindus occidentalis* Gaertn., *Tamarindus officinalis* Hook.	
Common Name	Tamarind Tree, Imli	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Chinch	
	• Gujarati : Khaati Amli	

Species Type	Herb	
Botanical Name	*Aloe barbadensis*	
Synonyms	*Aloe abyssinica* Lam., *Aloe chinensis* Baker, *Aloe indica* Royle, *Aloe littoralis* Koenig ex Baker, *Aloe vera* (L.) Burm.f., *Aloe vulgaris* Lam., *Alpinia allhugas* Roscoe, *Aloe barbadensis* Mill.	
Common Name	Aloe	
Family	Liliaceae	
Local Names	• Marathi :Korphad	
	• Gujarati : Ghrutakumari	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	*Senna occidentalis* (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Kaasundro	

Species Type	Herb	
Botanical Name	*Catharanthus roseus*	
Synonyms	*Lochnera rosea* (L.) Reichb., *Vinca rosea* L.*, Catharanthus roseus* (L.) G. Don	
Common Name	Sadabahar	
Family	Apocynaceae	
Local Names	• Marathi : Sadaphuli	

Species Type	Herb	
Botanical Name	*Cymbopogon citratus*	
Synonyms	*Andropogon citratus* DC., *Cymbopogon citratus* (DC.) Stapf	
Common Name	Lemon grass, Gandh-ghas	
Family	Poaceae	
Local Names	• Gujarati : Lili-cha	

Species Type	Herb	
Botanical Name	*Elettaria cardamomum*	
Common Name	Elaichi	
Family	Scitaminaceae	
Local Names	• Marathi : elaichi	

Species Type	Herb	
Botanical Name	*Mentha piperita*	
Common Name	Peppermint	
Family	Lamiaceae	
Local Names	• Marathi : Pudina	
	• Gujarati : Pudino	

Species Type	Herb	
Botanical Name	*Mimosa pudica*	
Synonyms	*Mimosa pudica L*.	
Common Name	Touch-me-not	
Family	Fabaceae-Mimosoideae	
Local Names	• Marathi : Lajwanti	
	• Gujarati : Lajaamni	

Species Type	Herb	
Botanical Name	*Ocimum basilicum*	
Common Name	Babui tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Sabja, tulas	
	• Gujarati : Damro	

Species Type	Herb	
Botanical Name	*Ocimum sanctum*	
Synonyms	*Ocimum inodurum* Burm.	
Common Name	Tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Krishna Tulas	
	• Gujarati : Vishnu Tulsi	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : isabgula	

Species Type	Herb	
Botanical Name	*Rauvolfia serpentina*	
Synonyms	*Ophioxylon album* Gaertn., *Ophioxylon serpentium* L., *Ophioxylon trifoliatum* Gaertn., *Rauvolfia trifoliata* (Gaertn.) Baill., *Rauvolfia serpentina* (L.) Benth. ex Kurz	
Common Name	Sarpagandha, chota chand	
Family	Apocynaceae	
Local Names	• Marathi : Sarpagandha	
	• Sanskrit: Sarpagandha	

Species Type	Herb	
BotanicalName	*Solanum surattense*	
Synonyms	*Solanum mccanni* Sant., *Solanum xanthocarpum* Schrad. & Wendl.	
CommonName	Kantakari, Kateli	
Family	Solanaceae	
Local Names	• Gujarati : Kantkari	

Species Type	Herb	
Botanical Name	*Swertia chirata*	
Common Name	Kiryata	
Family	Gentianaceae	
Local Names	• Gujarati : chirata	

Species Type	Herbs	
Botanical Name	*Zingiber officeinale*	
Common Name	Adrak	
Family	Zingiberaceae	
Local Names	• Marathi : Adrak	
	• Gujarati : adu	

Species Type	*Shrub*	
Botanical Name	*Withania somnifera*	
Synonyms	*Physalis flexuosa* L., *Physalis somnifera* L., *Withania somnifera* (L.) Dunal.	
Common Name	Ashwagandha	
Family	Solanaceae	
Local Names	• Marathi : Ashwagandha	
	• Gujarati : Ashwagandha	

Species Type	*Herb*	
Botanical Name	Kalanchoe pinnata	
Synonyms	• Bryophyllum pinnatum (Lam.) Oken. • Bryophyllum calycinum Salisb. • Cotyledon pinnata Lam.	
Family	Crassulaceae	
Local Names	• Gujarati : patthar-chatti	
	• Sanskrit :	

Species Type	Climber	
Botanical Name	*Asparagus racemosus*	
Synonyms	*Asparagus racemosus* Willd	
Common Name	Satavari	
Family	Liliaceae	
Local Names	• Marathi : Shatavari	
	• Gujarati : Shatavari	

Species Type	Shrub	
Botanical Name	*Adhatoda vasica*	
Synonyms	*Adhatoda vasica* Nees	
Common Name	Malabar nut	
Family	Acanthaceae	
Local Names	• Marathi :	
	• Gujarati :	

Species Type	Tree	
Botanical Name	*Pongamia pinnata*	
Common Name	Indian beach	
Family	Fabaceae-Papilionioideae	
Local Names	• Marathi : Karanj	
	• Gujarati : Karanj	

Species Type	Climber	
Botanical Name	*Tylophora indica*	
Synonyms	*Asclepias asthmatica* L. f., *Cynanchum bracteatum* Thunb., *C. indicum* Burm. f., Hoya hirsuta Moon. *Tylophora asthmatica* (L.f.) Wight & Arn.	
Common Name	Indian ipecacuanha	
Family	Asclepiadaceae	
Local Names	• Marathi : Damvel	
	• Gujarati : Damvel	

Species Type	Climber	
Botanical Name	*Piper longum*	
Synonyms	*Chavica roxburghii* Miq., *Piper longum* L.	
Common Name	Indian long pepper, Pipal	
Family	Piperaceae	
Local Names	• Marathi : Lendi pimpli	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Bacopa monnieri*	
Synonyms	*Bacopa monnieria* (L.) Wettst., *Gratiola monnieria* L., *Herpestis monniera* Benth., *Herpestis monnieria* (L.) HBK., *Lysimachia monnieri* L., *Moniera cuneifolia* Michx.	
Common Name	Thyme-leaved Gratiola , Jal Brahmi	
Family	Scrophulariaceae	
Local Names	• sanskruit : Brahmi	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Eclipta alba*	
Common Name	Bhangra	
Family	Asteraceae	
Local Names	• sanskruit : Bhrungaraj	
	• Gujarati : Bhaangro	
	• Hindi : Bhringraj	
	• Marathi : Maka (White)	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : Isabgol	

Species Type	Climber
Botanical Name	*Mucuna pruriens* 
Synonyms	*Carpopogon niveum* Roxb., *Carpopogon pruriens* Roxb., *Dolichos pruriens* L., *Mucuna nivea* (Roxb.) DC., *Mucuna prurita* Hook., *Stizolobium pruriens* (L.) Medikus
Common Name	Kawach
Family	Fabaceae
Local Names	• Marathi : Khaj-kujli - Black
	• Gujarati : Kaucha

Species Type	Herb
Botanical Name	*Trachyspermum ammi* 
Common Name	Carum Ajwain
Family	Apiaceae
Local Names	• Marathi : Owaa
	• Gujarati : Kaucha

Species Type	Tree	
BotanicalName	*Punica granatum*	
Synonyms	*Punica granatum* L.	
CommonName	Anar	
Family	Lythraceae	
Local Names	• Marathi : Dalimb	
	• Gujarati : Daadam	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	Senna occidentalis (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kaasundro	
	• Gujarati : Kaasundro	

ANNEXURE-II : LIST OF BIRDS SPOTTED IN & AROUND MU

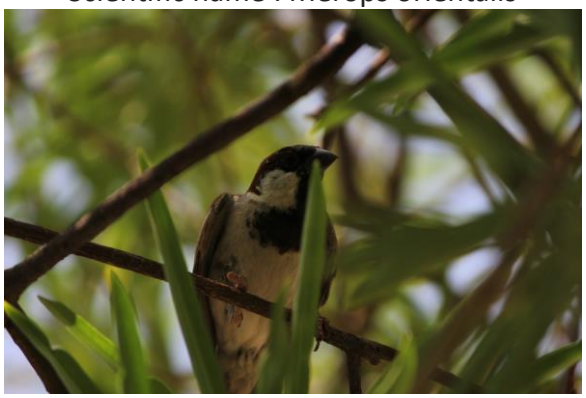
A survey was carried out to find the animal diversity in the campus of Marwadi University Rajkot. The survey focused on the diversity of birds, butterfly, Amphibia.

Common name: Purple sunbird
Scientific name : Cinnyris asiaticus

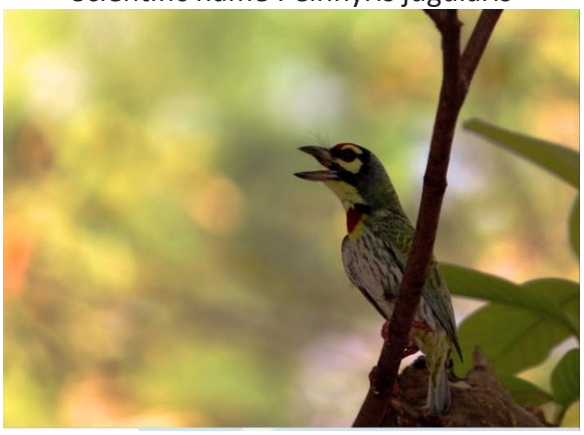
Common name: Common tailorbird
Scientific name : Orthotomus sutorius

Common name: Asian green bee-eater
Scientific name : Merops orientalis

Common name: olive-backed sunbird
Scientific name : Cinnyris jugularis



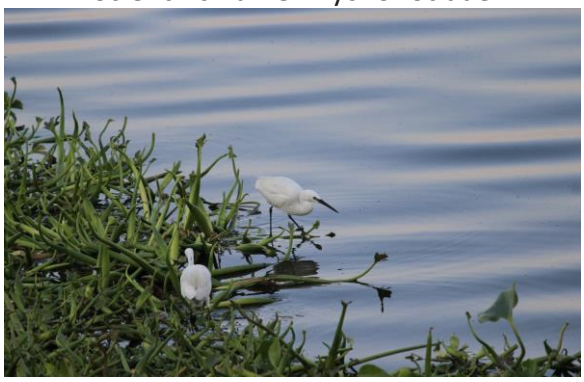
Common name: house sparrow
Scientific name : Passer domesticus



Common name: coppersmith barbet
Scientific name : Psilopogon haemacephalus

Common name: Bulbul
Scientific name : Pycnonotidae

Common name: laughing dove
Scientific name : Streptopelia senegalensis



Common name: Little egret
Scientific name : Egretta garzetta

Common name: Oriental darter
Scientific name : Anhinga melanogaster

Common name: Painted stork
Scientific name : Mycteria leucocephala

Common name:
Scientific name :

Common name: billed pelican
Scientific name : Pelecanus philippensis

Common name: Parrots
Scientific name : Psittaciformes

Common name: Robber flies
Scientific name : Asilidae

Common name: Dragonfly
Scientific name : Anisoptera

Common name:
Scientific name :

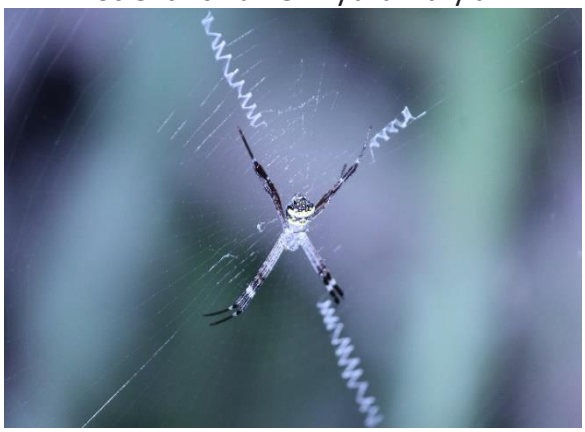
Common name:California sister
Scientific name :Adelpha bredowii

Common name:
Scientific name :

Common name: common tiger
Scientific name : Danaus genutia

Common name: Spotted Joker
Scientific name : Byblia ilithyia

Common name: Blue tiger
Scientific name : Tirumala limniace



Common name: Signature Spider
Scientific name : Argiope anasuja

Common name: button spider
Scientific name : Latrodectus umbukwane

ANNEXURE-III : LIST OF RAPTILES SPOTTED IN & AROUND MU

Scientific name: Rattus rattus
Common Name : House Rat

Scientific name: Calotes versicolor Common Name : Indian Garden Lizard

Scientific name: Hoplobatrachus tigerinus
Common Name : Indian Bull Frog

Scientific name: Naja naja
Common Name : Indian Cobra

Marwadi University
Marwadi Chandarana Group

GREEN AUDIT REPORT

2019-2020

Marwadi University

Rajkot-Morbi Road, Rajkot – 360003
Gujarat, India

Submitted By

Green Audit Team

TABLE OF CONTENTS

ACKNOWLEDGEMENT

Green Audit Assessment Team thanks to the Dean, Marwadi University, Rajkot for assigning the task of Green Audit of the university campus to us. We appreciate the cooperation that we got from all the faculties and students during the entire process. Our special thanks to Prof. (Dr.) Sandeep Sancheti, Provost and Shri Naresh Jadeja, Registrar of the university for their warm support and encouragement from the very beginning till the end of the process.

We are also thankful to the testing and consultancy cell for provided various test report done by them to match requirement of this audit & helping us in collecting different data and analyzing them.

The entire team is very grateful to the management of Marwadi University for their continuous support and motivation to take various innovative and challenging assignments.

Dr. Tarak Vora
Team Leader
Green Audit Team
Marwadi University. Rajkot

DISCLAIMER

Green Audit Team Has prepare this report on the basis of primary data collected from the different areas of the university. All reasonable care has been takesn in its preparation: details contained in this reprort have been compiled in good faith based on information gathered.

Date: 25/03/2020

Prepared by:
Green Audit Team

1. BRIEF ABOUT MARWADI UNIVERSITY

In 2007-08 the availability of world class academic facilities in the Saurashtra region were sparse; which encouraged Marwadi Group, Rajkot to launch Marwadi Education Foundation's Group of Institutes, offering Technical and Professional UG & PG courses and programs such as B.E, MBA and MCA. Marwadi Education Foundation's Group of Institutions (MEFGI) was incepted as a major organ of Marwadi Education Foundation's Group of Institutions in 2008, under the Bombay Public Trust Act 1950. Marwadi Education Foundation's Group of Institutions is a body promoted by Marwadi Shares & Finance Limited; a major stock broking company in India & Chandarana Intermediaries Brokers Pvt. Ltd. Since its inception Marwadi Education Foundation's Group of Institutions were affiliated with Gujarat Technological University.

Commitment to provide best and industry relevant education received an overwhelming trust from the society and in order to blend Engineering with Science and support them through Management and Law disciplines and have multi disciplinary course offerings in Science, Commerce, Arts, Health and Management, Marwadi Education Foundation proposed to establish "Marwadi University" in the Year 2016. Marwadi University bill was introduced and passed in Gujarat Assembly and Marwadi University was established under Gujarat Private Universities act no. 9 of 2016 on 9th May, 2016.

2. VISION & MISSION OF MARWADI UNIVERSITY

2.1 VISION OF THE UNIVERSITY

Our vision is to address challenges facing our society and planet through sterile education that builds capacity of our students and empower them through their innovative thinking practice and character building that will ultimately manifest to boost creativity and responsibility utilizing the limited natural resources to meet with the challenges of the 21st century.

2.2 MISSION OF THE UNIVERSITY

- ✓ To produce creative, responsible and informed professionals.
- ✓ To produce individuals who are digital-age literates, inventive thinkers, effective communicators and highly productive.
- ✓ To deliver cost-effective quality education.
- ✓ To offer world-class, cross-disciplinary education in strategic sectors of economy though well devised and synchronized delivery structure and system, designed to tickle the creative intelligence and enhance the productivity of individuals.
- ✓ To provide a conducive environment that enables and promotes individuals to creatively interact, coordinate, disseminate and examine change, opinion as well as concept that will enable students to experience higher level of learning acquired through ceaseless effort that lead to the development of character, confidence, values and technical skills.

3. GREEN AUDIT

Modernization and industrialization are the two important outputs of the twentieth century that have made human life more luxurious and comfortable. They are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources, and finally making our mother Earth ugly and inhospitable. The time has come to wake up, unite and combat together for a sustainable environment.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, universities, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly university.

3.1 GOALS OF GREEN AUDIT

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To conduct a survey to know the ground reality about green practices.
- To make sure that rules and regulations are taken care of to save environment.
- To avoid the interruptions in environment that are more difficult to handle and whose correction requires higher cost.
- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issues.
- To Identify strengths and weaknesses in green practices.

3.2 BENEFITS OF GREEN AUDIT

- It would help to protect the environment in and around the campus.
- Recognize the cost saving methods through waste minimization and management.
- Empower the organization to frame a better environmental performance.
- Point out the prevailing and fourth coming impacts on environment.
- Recognize the cost-saving methods through waste minimizing and managing.
- Ensures conformity with the applicable laws.
- Empower the organizations to frame a better environmental performance.
- Developing an environmental ethic and value systems in youngsters.
- It portrays a good image of an institution which helps building better relationships with the group of interested parties.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the University.
- It will help to build a positive impression through green initiatives for the upcoming NAAC visit.

4. ENVIRONMENTAL POLICY OF THE UNIVERSITY

Marwadi University, Rajkot always believes in maintaining its own standard in matter of environment and quality consciousness. It has taken number of initiatives to protect its own environment with a pollution free campus.

To create a green cover, Eco-friendly atmosphere, pure oxygen at the university campus, a plantation program is organized every year with active participation from the university community and visitors. Green Audit Team owns responsibility to preserve the work carried out on the campus related to the environment.

This also helps in ensuring that the Environmental Policy is enacted, enforced, and reviewed using various environmental awareness programs.

ENVIRONMENTAL POLICY

Both the teaching and Non-teaching staff of Marwadi University Rajkot are committed for carrying out its activity for sustainable development. This we will achieve through the following :-

i. To educate students and staff on how to appropriately utilize water effectively.
ii. To put the campus' "Rain Water Harvesting" to use.
iii. To make the most of the solar energy generated by the solar panels on the roofs of educational buildings.
iv. To use ICT as much as possible while using paper as little as possible. It will contribute to the "Paperless Office" initiative.
v. Using vermin-compost on the campus to turn solid waste into fertilizer.
vi. To lessen the campus' noise pollution.
vii. To protect and nurture the Flora and Fauna on the campus
viii. To maintain green campus.
ix. To use treated waste water for flushing and gardening purpose.
x. To use recycle the waste material and make them usable.

5. CONSTITUTION FOR GREEN AUDIT

The Green Audit is carried out as per the environmental policy of the Green audit checklist. The aim of the audit is to check the existing practices and provide advice for the development of environmental policy and practice in the areas of:

- ✓ Waste management
- ✓ Management water conservation and management
- ✓ Tree plantations
- ✓ Bio-diversity and threatened/ endangered species
- ✓ Preservations Energy use and conservations
- ✓ Eco-friendly campus
- ✓ Green environment and clean campus
- ✓ Spread environmental awareness
- ✓ Educate the people about sustainability

MEMBERS OF GREEN AUDIT TEAMS

Sr. No.	Name of Auditor	Designation
1	Dr. Tarak Vora	Team Leader
2	Dr. Abhishek Gupta	Member
3	Dr. Archana Sharma	Member
4	Dr. Nitinkumar Singh	Member
5	Dr. Hirendrasinh Padhiyar	Member
6	Mrs. Bhavna Thummar	Member
7	Mr. Raj Chapala	Member
8	Mr. Jyupil Joshi	Member
9	Mr. Devesh Poorey	Member
10	Mr. Ravi Modi	Member
11	Mr. Kalpesh Chandarana	Member

6. OBJECTIVES OF THE STUDY

The green audit's primary goal is to support environmental management and conservation on college campuses. According to the relevant laws, rules, and standards, the audit's goal is to identify, measure, explain, and prioritise the framework for environmental sustainability. The following are the primary goals of doing a green audit:

- ✓ To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use on the campus.
- ✓ To establish a baseline data to assess future sustainability by avoiding the interruptions inenvironment that are more difficult to handle and their corrections requires high cost.
- ✓ To bring out a status report on environmental compliance

7. METHODOLOGY

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered thefollowing areas to summarise the present status of environment management in the campus

- ➢ **Water management**
  - ✓ Raw Water
  - ✓ Drinking Water
  - ✓ Waste Water
  - ✓ Sewage Water
  - ✓ Rain Strom Drain Water
- ➢ **Energy Conservation**
  - ✓ Petrol
  - ✓ Diesel
  - ✓ LPG
  - ✓ Electricity
- ➢ **Waste management**
  - ✓ Domestic Waste
  - ✓ Grass Waste

8. FOCUS AREA OF AUDIT

To match with the objective of the green audit, following areas are kept under the scope of the audit.

1. Water management
2. Air Pollution Management
3. Noise Pollution Management
4. Waste Management
5. Green belt area & Bio-diversity

8.1 WATER MANAGEMENT

Water is a valuable natural resource for all living organisms. It is freely available depending on the climate and topographic features of a region. Water is a precious natural national resource available with a fixed quantum. The availability of water is decreasing due to the increasing population of the nation; as per capita availability of utilized water is going down.

Even though it is naturally present, drinking water that is portable is not easily available for human consumption. Just 3% of the water on our planet, which covers 70% of its surface, is fresh water. The world's 1.1 billion inhabitants are experiencing a water crisis. Water issue is greatly impacted by water pollution and waste. An alarming amount of water is being contaminated. Water contamination can cause a variety of illnesses or even death. Because of this, it's crucial to make sure that drinking water is sterile, clean, and free of germs and illnesses. Also, it's crucial to manage, protect, and conserve water resources so that they may be used sustainably. The use and quality of water on the university campus are being studied by our institution. Water auditing is done to assess raw water intake facilities and identify facilities for water treatment and reuse. The concerned auditor looks at the appropriate approach that may be used to balance the supply and demand for water.

USES AND MANAGEMENT

SOURCE OF WATER

Sr. No.	Resource	Quantity
1	GWI (Narmada WATER)	-----
2	No of Open Well	02
3	No of Bore-well	03
4	Water reserve - Underground Tank	4 Lack Liters

WATER USERS IN CAMPUS

Sr. No.	Person in different section	Strength (No. of person - Approx)
1	Staff	430
2	Hostel Boarders	1380
3	Residential Family Members	40
4	Visitors	2000
5	Construction Labour	145

The visitors of the college vary with respect to different activities conducted in the college campus. During admission and different competitive exam conducted in the college campus. The total number of visitors of the college increases up to 2000 on such day.

WATER CONSUMPTION IN DIFFERENT ACTIVITYIN COLLEGE CAMPUS

Activity	Water used per activity (in Litter)	No. of times Activity performed in a day	Average water used Person/Day	No. of people using water	Total water consumption per Day
Hand and face wash	4-6 L	4	16-24L	1500	3000
Drinking Water	0.2-0.4L	6	1.2-2.4L	1500	2700
Toilet Flush	8-10L	4	32-40L	1500	54000
Bath	30-40 L	1	30-40 L	1500	52500
Cooking & Washing In resident	150-250L	2	300-500L	54	21600
Cooking & Washing Hostel	10-15L	4	40-60L	1500	75000
Total					235800

WATER QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : DRINKING WATER								
Test Report No / Ref.No. :- TA-191							**Date: 10-6-2019**	
Name of Customer	Marwadi University, Rajkot							
Address of Customer	Rajkot - Morbi Highway, Gauridad.							
Environmental	Ambient							
Date of Sample	5/6/2019							
Nature of Sample	Colour: Colour less							
Sample Quntitiy	100 ml							
Packing Type	Plastic bottle							
Type of Sampling	Grab							
Sample Collected By	Mr. Kalpesh Parmar							
Date of analysis	6/6/2019							
Analysis conclude on	10/6/2019							
Sr. No.	**Parameter**	**Units**	**Test Method**	**Permissible Limit**	**Main Building**	**Main Building**	**PG Building**	**Law Building**
1	**pH**	-	APHA 23rd Ed.,2017,4500-H+B	6.5 - 8.5	7.38	7.26	7.48	7.22
2	**TDS**	mg/L	APHA 23rd Ed. Method 2540-C	500	155	122	181	128
3	**Turbidity**	FNU	APHA 23rd Edition 2130-B(Page No.2-13)	1	0.44	0.56	0.83	0.78
4	**Conductivity**	µs/cm	APHA 23rd Ed. Titration Method 2510-B	200-800	347	352	341	387
5	**Chloride**	mg/L	APHA 23rd Ed 4500-Cl-B (Page No.4-75)	250	59	85	48	85
6	**Total Hardness**	mg/L	APHA 23rd Ed. Method 2510-B	200	108	101	157	188

*NOTE

1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL = Minimum Detection Limit
2. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
3. This office is not responsible for the authenticity for the samples not collected by our officials.
4. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
5. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

End of Report

STP TREATED WATER QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : STP WATER SAMPLES							
Test Report No / Ref.No. :- TA-201							**Date: 06-12-2019**
Name of Customer	Marwadi University						
Address of Customer	Rajkot - Morbi Highway, Gauridad.						
Date of Sample Collection	01-12-2019						
Sample Collected By	Mr. Deepak bhai						
Sample Tested By	Mr. Raj Chapala, Mr. Avon Dobariya & Mr. Jitesh Joshi						
Date of analysis starts	02-12-2019						
Analysis conclude on	06-12-2019						
Sr. No.	**Parameters**	**Units**	**Test Method**	**Acceptable Limit**	**Inlet**	**Treated Water (Before Filtration)**	**Treated Water (After Filtration)**
1	**pH**	-	APHA 23rd Ed.,2017,4500-H+B	6.5-8.5	7.11	7.78	7.51
2	**BOD**	mg/L	APHA 23rd Ed. Method 2540-C	30	148	89	29
3	**COD**	mg/L	APHA 23rd Edition 21308	100	201	110	57
4	**TSS**	mg/L	APHA 23RD Edition 2540 D	100	118.2	87.4	46.6
5	**Turbidity**	FNU	APHA 23rd Edition 2130-B	5	16.8	7.9	1.4
6	**Oil and Grease**	mg/L	APHA 23RD Edition 5520 G	10	18.3	11.1	8.1
7	**Ammonical Nitrogen**	mg/L	APHA 23RD Edition 4500-NH3 C	5	10.2	2.99	2.05

***NOTE**

1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

Testing Incharge

Team Leader

OBSERVATIONS IN REGARD OF WATER USAGES AND CONSERVATION PLAN

1. Treated water is used for flushing through dual plumbing system installed in all the buildings.
2. The garden is watered using sprinklers and drip irrigation system installed throughout the campus.
3. Drinking water quality is being tested regularly as per plan.
4. Law flow water fixtures are installed in bathroom and toilets.
5. Water level sensors are installed in the water tank for overflow cutoff.
6. Rainwater harvesting is done in the lake created in the campus.

8.2 AIR POLLUTION MANAGEMENT

PERIODIC AWARENESS PROGRAMME FOR STAFF, STUDENTS AND SOCIETY

The university has consistently run programmes to raise staff, student, and societal awareness of the need to preserve and conserve the environment. Moreover, programmes and rallies on different environmental and health-related topics are organised in order to raise awareness. Students and professors at the university participate in NSS/NCC-related events.

A) MASS TRANSPORTATION FACILITY

As such campus is not generating any air pollution by its own activity except it has its own transportation department. Faculties and students of the university are motivated to use mass transportation system. Faculties are given some advantages for use of the bus facility provided by the university.

All the office bearer are motivated to use the university vehicles on sharing basis. It has been mandated unless and until its an emergency do not use university vehicles for single persons.

AIR QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : AMBIENT AIR					
Name of Customer	Marwadi University				
Address of Customer	Rajkot - Morbi Highway, Gauridad.				
Environmental Condition	Satisfactory				
Date of Sample Collection	29-09-2019				
Nature of Sample	Colour : Colour Less				
Sample Collected By	Jyupil Joshi				
Sample Tested By	Raj Chapala				
Date of analysis starts	30-09-2019				
Analysis conclude on	30-09-2019				
Sr. No.	**Parameters**	**Units**	**Test Method**	**Permissible Limit**	**MAIN BUILDING**
1	**PM_{10}**	($\mu g/m^3$)	IS 5182 (Part 23) (1999, Reaffirmed 2010)	100	36.48
2	**$PM_{2.5}$**	($\mu g/m^3$)	NAAQMS/36/2012-13	60	19.57
3	**SO_2**	($\mu g/m^3$)	IS 5182 (Part 2)	80	1.21
4	**NO_X**	($\mu g/m^3$)	IS 5182 (Part 6)	80	3.58

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL = Minimum
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

Testing Incharge

Team Leader

STACK ASSESSMENT REPORT

ANALYSIS REPORT : STACK : DG SET					
Test Report No / Ref.No. :- TA-222					**Date:- 15-01-2020**
Name of Customer	Marwadi University, Rajkot				
Address of Customer	Rajkot - Morbi Highway, Gauridad.				
Temperature	31°C				
Weather Condition	Satisfactory				
Date of Sample Collection	14-01-2020				
Nature of Sample	Colour : Colour Less				
Sample Collected By	Dr. Tarak Vora, Mr. Jitesh Joshi & Mr. Jyupil Joshi				
Date of analysis starts	14-01-2020				
Analysis conclude on	15-01-2020				
Sr. No.	**Parameters**	**Units**	**Test Method**	**Permissible Limit**	**DG Set**
				Stack Height In Meter	**10**
1	**PM**	mg/Nm^3	IS 11255 (Part 1)	150	44.79
2	**SO_2**	ppm	IS 11255 (Part 2)	100	21.22
3	**NO_x**	ppm	IS 11255 (Part 7)	50	36.21

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit

End of Report

Dr. Nitin Kumar Singh
Testing Incharge

Dr. Tarak Vora
Quality Manager

8.3 NOISE POLLUTION MANAGEMENT

A) SILENCE ZONES IN THE UNIVERSITY

For awareness of the need to preserve silence at the institution, several display boards have been put up in the library and other locations.

B) NOISE CONTROL IN THE UNIVERSITY

The institution has enacted a no honking policy that forbids the use of any noise on campus, including honking.

On college campuses, noise pollution is maintained to a minimum and designated quiet zones are established in places like the library and classrooms.

C) DG SET FOR POWER BACK-UP

Every time there is a power outage because of load shedding or maintenance on the college campus, the college uses its DG backup system. Noise monitoring of the stack of DG set is being done on regular basis.

NOISE LEVEL ASSESSMENT REPORT

ANALYSIS REPORT : NOISE			
Name of Customer		Marwadi University	
Address of Customer		Rajkot - Morbi Highway, Gauridad.	
Environmental Condition		Satisfactory	
Date of Sample Collection		12-12-2019	
Sr. No.	**Location**	**Permissible limit**	**Day (dB-A)**
1	**Main Gate**	65	64
2	**PG Building**		52
3	**Hostel Aera**		54
4	**Main Canteen**		53
5	**New Canteen**		51

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit

Testing Incharge

Team Leader

8.4 WASTE MANAGEMENT

Waste management is the managing of waste by disposal and recycling of it. Moreover, waste management needs proper techniques keeping in mind the environmental situations. For instance, there are various methods and techniques by which the waste is disposed of. Some of them are Landfills, Recycling, Composting, etc. Furthermore, these methods are much useful in disposing of the waste without causing any harm to the environment. Waste management is a very crucial aspect of any of the organization. Marwadi university campus is spreaded over 42 acres of land where it is dealing with different types of waste as listed below.

- ✓ Domestic waste
- ✓ Food waste
- ✓ Green waste

OBSERVATIONS

SEGREGATION OF DOMESTIC WASTE

Colour coded dustbins are installed. Three separate dustbins, near each block for disposal of different types of wastes. All the segregated wastes are dumped in the particular dustbins of green, blue, yellow colour.

- ✓ The wet and biodegradable wastes are dumped in green dustbin. For e.g.: kitchen wastes including vegetables and fruits skins.
- ✓ Disposal of plastic wrappers and non-biodegradable wastes are meant for blue coloured dustbin.
- ✓ Papers and glass bottles are disposed in yellow dustbins
- ✓ Cleaning or emptying of the dustbins is being done on a regular basis at an allocated time.

RECYCLING OF WASTE

Vermicomposting is a method of making compost, with the use of earthworms, which generally live-in soil, eat biomass and excrete it in digested form. This compost is generally called vermicompost or Wormicompost. Marwadi University has prepared the composting beds for converting grass waste into the compost. Compost produced through the beds are distributed to the students and faculties of the campus.

INSTALLATION OF BIOGAS PLANT

University has installed 45 CUM capacity biogas plant within the campus. Where the combination of cow dung, food waste and grass waste is used as raw material. Biogas produced from the plant is utilized for cooking in the hostel canteen.

8.5 GREEN BELT AREA & BIO-DIVERSITY

The Green Belt Area is intended to preserve the environment and enhance the visual value of the college grounds. To guarantee that the structures adhere to green standards, the college's green area consists of the campus's vegetation, greenery, and sustainability. Also, by implementing various environmental awareness programmes, this aids in ensuring that the Environmental Policy is adopted, implemented, and evaluated.

OBSERVATIONS

The campus is close to over 50 different types (species) of flora and animals. Via the NSS unit, several tree planting initiatives are held during the months of July and August on college campuses and in the nearby communities. This initiative aids in promoting an eco-friendly atmosphere that gives the institute pure oxygen and raises awareness among the communities. The planting initiative comprises a variety of native decorative and therapeutic plants. The occurrence of similar species planted, such as "NEEM," is noted rather than sustaining biodiversity. Neem, Indian Blackberry Tree, Flame Tree, Mango Tree, Jack Fruit Tree, Teak, and Spanish Cherry Plant are the predominant species in the green belt.

9. EXECUTIVE SUMMERY & RECOMMENDATIONS

The university has created a green environmental policy and is working to promote sustainable growth on the campus. The university has created a team of academics and students that works to preserve biodiversity on the campus and contributes to efforts to reduce pollution in society. The university intends to add environmental management and protection to its curriculum. The university has given faculty and students workshops and trainings on environmental awareness. Law flow water fixures are installed in the campus. Campus have planned for waste management and taken initatives towards recycling of waste.

It is also verified that the initiatives on almost all the recommendations of the previous year have been taken by the university which are found satisfactory.

RECOMMENDATIONS

1. Cover energy auditing under the umbrella of green audit.
2. Plan to install solar panels to have green energy utilization
3. Special Tree Plantation shall be celebrated every year on environment day and also competitions for bird species identification and knowing the tree values in terms of medicinal and environment conservation
4. Additional energy meters to be placed to track water and energy usage by building and department.
5. Increase awareness about use of bicycle in campus and conduct cycling events.

ANNEXURE I : LIST OF TREES & PLANTS SPOTTED IN & AROUND MU

A survey was carried out to find plant diversity in the campus of Marwadi University. The survey was focused on the diversity of plants and trees on the basis of their classification and economic importance.

Species Type	Tree	
Botanical Name	*Bauhinia purpurea*	
Common Name	Butterfly Tree, geranium Tree	
Family	Fabaceae Caesalpinioideae	
Local Names	• Gujarati: Hadayparni	
	• Sanskrit : Kanchanar (red)	

Species Type	Tree	
Botanical Name	Azadirachta indica	
Synonyms	*Antelaea indica* (L.) Adelb., *Melia azadirachta* L., *Melia indica* (A. Juss.) Brandis	
Common Name	Neem	
Family	Meliaceae	
Local Names	• Hindi :	Neem
	• Gujarati :	Limbado , Kadavo Limbado
	• Sanskrit :	Nimba

Species Type	Tree	
Botanical Name	Khaya senegalensis	
Common Name	Senegal Mahogany, African Mahogany, Senegal Khaya	
Family	Meliaceae	
Local Name	• Gujarati: Khaya	

Species Type	Tree	
Botanical Name	Spathodea campanulata	
Common Name	*African tulip tree*	
Family	Bignoniaceae	
Local Names	• Gujarati: Tulip tree	

Species Type	Tree	
Botanical Name	Samanea saman	
Common Name	Saman,Pukul Lima, Cow Tamarind, Hujan-Hujan, East Indian Walnut, Monkey, rain tree	
Family	Fabaceae (alt. Mimosaceae), legume family	
Local Names	• Gujarati: *Shirish,*	
	• Sanskrit :*Shiriisha*	

Species Type	Tree	
Botanical Name	*Terminalia mantaly*	
Common Name	Madagascar Almond, Umbrella Tree	
Family	Combretaceae	
Local Names	• Gujarati: African tree	

Species Type	Tree	
Botanical Name	Alstonia scholaris	
Common Name	Scholar Tree, Dita bark, Devil tree, Blackboard Tree	
Family	Apocynaceae	
Local Names	• Gujarati: *Saptaparni*	
	• Sanskrit :Saptaparna	
Uses	Medicinal uses: ⚠Its bark, known as Dita Bark, is used in traditional medicine to treat dysentery and fever. In Ayurveda it is used as a bitter and as an astringent herb for treating skin disorders, malarial fever, urticaria, chronic dysentery, diarrhea, in snake bite and for upper purification process of Panchakarma . The Milky juice of the tree is applied to ulcers.	

Species Type	Tree	
Botanical Name	Lagerstroemia speciosa	
Common Name	Giant crepe-myrtle, Queen's crepe-myrtle, banabá plant, or pride of India	
Family	Bignoniaceae	
Local Names	• Gujarati: Jarul, Moto Bhondar	
	• Sanskrit : Syandana	

Species Type	Tree	
Botanical Name	Senna siamea	
Common Name	kassod tree, cassod tree and cassia tree	
Family	Fabaceae	
Local Names	• Gujarati: kashid tree	

Species Type	Tree	
Botanical Name	Delonix regia	
Common Name	*Flame Tree, Royal Poinciana*	
Family	Fabaceae	
Local Names	• Gujarati: Gulmohar	
	• Sanskrit : Raj abharan tree, Krishna chud tree	

Species Type	Shrub	
Botanical Name	*Ocimum gratissimum*	
Synonyms	*Ocimum gratissimum L*.	
Common Name	Shrubby basil, Rama tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Jangli tulasi	

Species Type	Shrub	
Botanical Name	*Hibiscus rosa-sinensis*	
Common Name	Jasud, Shoe flower and china rose	
Family	Malvaceae	
Local Names	• Gujarati Name-: Jasud	

Species Type	Shrub	
Botanical Name	*Lawsonia inermis*	
Synonyms	*Lawsonia alba* lam., *Lawsonia spinosa* L.	
Common Name	Mehandi	
Family	Lythraceae	
Local Names	• Marathi : Mehendi	
	• Gujarati : Mehndi	

Species Type	Shrub	
Botanical Name	*Datura metel*	
Synonyms	*Datura fastuosa* L., *Datura fastuosa* var. *alba* (Nees) C.B. Clarke	
Common Name	Dhattura	
Family	Solanaceae	
Local Names	• Marathi : Dhotra - Black	
	• Gujarati : Dhaturo	

Species Type	Shrub	
Botanical Name	*Rauvolfia tetraphylla*	
Synonyms	*Rauvolfia canescens* L., *Rouvolfia tomentosa* Jacq., *Rauvolfia tetraphylla* L.	
Common Name	Bara Chand	
Family	Apocynaceae	
Local Names	• Gujarati : Sarpagandha	

Species Type	Shrub	
Botanical Name	*Mimosa pudica*	
Synonyms	Touch me not	
Common Name	Ail	
Family	Fabaceae - Mimosoideae	
Local Names	Gujarati : lajawni	

Species Type	Tree	
Botanical Name	*Bauhinia variegata*	
Synonyms	*Bauhinia candida* Roxb.	
Common Name	*Mountain ebony*, Kachnar	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kanchnar	
	• Sanskrit Kanchanar (white)	

Species Type	Tree	
BotanicalName	*Bixa orellana*	
Synonyms	*Bixa orellana* L.	
CommonName	Sindhuri	
Family	Bixaceae	
Local Names	• Marathi : Shenduri	

Species Type	Tree	
Botanical Name	Butea monosperma	
Synonyms	*Butea frondosa* Koening ex Roxb., *Erythrina monosperma* Lam., *Butea monosperma* L.	
Common Name	Palas	
Family	Fabaceae-Papilionioideae	
Local Names	• Marathi : Palas, khakra	
	• Gujarati : Khaakhro	
	• Hindi : Palash	

Species Type	Tree	
Botanical Name	*Eucalytus globulus*	
Synonyms	*Eucalyptus gigantea* Dehn., *Eucalyptus glauca* DC., *Eucalyptus perfoliata* Desf., *Eucalyptus pulverulenta* Link	
Common Name	Australian gum Tree, Eucalyptus	
Family	Myrtaceae	
Local Names	• Marathi : Nilgiri	
	• Gujarati : Nilgiri	

Species Type	Tree	
Botanical Name	*Nyctanthes arbo-tristis*	
Synonyms	*Bruschia macrocarpa* Bertol., *Nyctanthes arbor-tristis* var. dentata Hort.ex Moldenke, *Nyctanthes dentata* Blume, *Nyctanthes tristis* Salisb., Parilium arbor-tristis Gaertn., *Scabrita triflora* L.	
Common Name	Night jasmine, Harshingar	
Family	Nyctanthaceae	
Local Names	• Sanskrit : Parijata	
	• Gujarati : Paarijaat	

Species Type	Tree	
Botanical Name	*Peltophorum pterocarpum*	
Synonyms	*Caesalpinia gleniei* Thwaites, *Caesalpinia inermis* Roxb., Inga pterocarpa DC., *Peltophorum ferrugineum* (Decne) Benth., *Peltophorum inerme* (Roxb.) Llanos, *Peltophorum roxburghii* (G.Don) Degener, *Poiciana roxburghii* G.Don	
Common Name	Yellow gold mohur	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Taamraparni	

Species Type	Tree
Botanical Name	*Cocos nucifera* 
Common Name	Coconut palm
Family	Arecaceae
Local Names	• Marathi : Naral
	• Gujarati :Nariyeli

Species Type	Tree
Botanical Name	*Ficus religiosa* 
Synonyms	Urostigma religiosum (L.) Gasparrini
Common Name	Bot-Tree, Pipal
Family	Moraceae
Local Names	• Marathi : Pimpal

Species Type	Tree	
Botanical Name	*Mangifera indica* L.	
Synonyms	*Mangifera indica* L.	
Common Name	Aam	
Family	Ancardiaceae	
Local Names	• Marathi : Amba	

Species Type	Tree	
Botanical Name	*Murraya Koenigii*	
Synonyms	*Bergera koenigii* L., *Chalcas koenigii* (L.) Kurz, *Murraya foetidissima* Teijsm. & Binnend, *Murraya koenigii* (L.) Spreng	
Common Name	Indian curry leaf Tree, Mitha neem	
Family	Rutaceae	
Local Names	• Marathi : kadhi patta	
	• Gujarati: Mitho Limdo	

Species Type	Tree	
Botanical Name	*Saraca indica*	
Common Name	Asoka	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : ashok	
	• Gujarati : Ashok	

Species Type	Tree	
Botanical Name	*Tamarindus indica*	
Synonyms	*Tamarindus occidentalis* Gaertn., *Tamarindus officinalis* Hook.	
Common Name	Tamarind Tree, Imli	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Chinch	
	• Gujarati : Khaati Amli	

Species Type	Herb	
Botanical Name	*Aloe barbadensis*	
Synonyms	*Aloe abyssinica* Lam., *Aloe chinensis* Baker, *Aloe indica* Royle, *Aloe littoralis* Koenig ex Baker, *Aloe vera* (L.) Burm.f., *Aloe vulgaris* Lam., *Alpinia allhugas* Roscoe, *Aloe barbadensis* Mill.	
Common Name	Aloe	
Family	Liliaceae	
Local Names	• Marathi :Korphad	
	• Gujarati : Ghrutakumari	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	*Senna occidentalis* (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Kaasundro	

Species Type	Herb	
Botanical Name	*Catharanthus roseus*	
Synonyms	*Lochnera rosea* (L.) Reichb., *Vinca rosea* L.*, Catharanthus roseus* (L.) G. Don	
Common Name	Sadabahar	
Family	Apocynaceae	
Local Names	• Marathi : Sadaphuli	

Species Type	Herb	
Botanical Name	*Cymbopogon citratus*	
Synonyms	*Andropogon citratus* DC., *Cymbopogon citratus* (DC.) Stapf	
Common Name	Lemon grass, Gandh-ghas	
Family	Poaceae	
Local Names	• Gujarati : Lili-cha	

Species Type	Herb	
Botanical Name	*Elettaria cardamomum*	
Common Name	Elaichi	
Family	Scitaminaceae	
Local Names	• Marathi : elaichi	

Species Type	Herb	
Botanical Name	*Mentha piperita*	
Common Name	Peppermint	
Family	Lamiaceae	
Local Names	• Marathi : Pudina	
	• Gujarati : Pudino	

Species Type	Herb	
Botanical Name	*Mimosa pudica*	
Synonyms	*Mimosa pudica L*.	
Common Name	Touch-me-not	
Family	Fabaceae-Mimosoideae	
Local Names	• Marathi : Lajwanti	
	• Gujarati : Lajaamni	

Species Type	Herb	
Botanical Name	*Ocimum basilicum*	
Common Name	Babui tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Sabja, tulas	
	• Gujarati : Damro	

Species Type	Herb	
Botanical Name	*Ocimum sanctum*	
Synonyms	*Ocimum inodurum* Burm.	
Common Name	Tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Krishna Tulas	
	• Gujarati : Vishnu Tulsi	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : isabgula	

Species Type	Herb	
Botanical Name	*Rauvolfia serpentina*	
Synonyms	*Ophioxylon album* Gaertn., *Ophioxylon serpentium* L., *Ophioxylon trifoliatum* Gaertn., *Rauvolfia trifoliata* (Gaertn.) Baill., *Rauvolfia serpentina* (L.) Benth. ex Kurz	
Common Name	Sarpagandha, chota chand	
Family	Apocynaceae	
Local Names	• Marathi : Sarpagandha	
	• Sanskrit: Sarpagandha	

Species Type	Herb	
BotanicalName	*Solanum surattense*	
Synonyms	*Solanum mccanni* Sant., *Solanum xanthocarpum* Schrad. & Wendl.	
CommonName	Kantakari, Kateli	
Family	Solanaceae	
Local Names	• Gujarati : Kantkari	

Species Type	Herb	
Botanical Name	*Swertia chirata*	
Common Name	Kiryata	
Family	Gentianaceae	
Local Names	• Gujarati : chirata	

Species Type	Herbs	
Botanical Name	*Zingiber officeinale*	
Common Name	Adrak	
Family	Zingiberaceae	
Local Names	• Marathi : Adrak	
	• Gujarati : adu	

Species Type	*Shrub*	
Botanical Name	*Withania somnifera*	
Synonyms	*Physalis flexuosa* L., *Physalis somnifera* L., *Withania somnifera* (L.) Dunal.	
Common Name	Ashwagandha	
Family	Solanaceae	
Local Names	• Marathi : Ashwagandha	
	• Gujarati : Ashwagandha	

Species Type	*Herb*	
Botanical Name	Kalanchoe pinnata	
Synonyms	• Bryophyllum pinnatum (Lam.) Oken. • Bryophyllum calycinum Salisb. • Cotyledon pinnata Lam.	
Family	Crassulaceae	
Local Names	• Gujarati : patthar-chatti	
	• Sanskrit :	

Species Type	Climber	
Botanical Name	*Asparagus racemosus*	
Synonyms	*Asparagus racemosus* Willd	
Common Name	Satavari	
Family	Liliaceae	
Local Names	• Marathi : Shatavari	
	• Gujarati : Shatavari	

Species Type	Shrub	
Botanical Name	*Adhatoda vasica*	
Synonyms	*Adhatoda vasica* Nees	
Common Name	Malabar nut	
Family	Acanthaceae	
Local Names	• Marathi :	
	• Gujarati :	

Species Type	Tree	
Botanical Name	*Pongamia pinnata*	
Common Name	Indian beach	
Family	Fabaceae-Papilionioideae	
Local Names	• Marathi : Karanj	
	• Gujarati : Karanj	

Species Type	Climber	
Botanical Name	*Tylophora indica*	
Synonyms	*Asclepias asthmatica* L. f., *Cynanchum bracteatum* Thunb., *C. indicum* Burm. f., Hoya hirsuta Moon. *Tylophora asthmatica* (L.f.) Wight & Arn.	
Common Name	Indian ipecacuanha	
Family	Asclepiadaceae	
Local Names	• Marathi : Damvel	
	• Gujarati : Damvel	

Species Type	Climber	
Botanical Name	*Piper longum*	
Synonyms	*Chavica roxburghii* Miq., *Piper longum* L.	
Common Name	Indian long pepper, Pipal	
Family	Piperaceae	
Local Names	• Marathi : Lendi pimpli	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Bacopa monnieri*	
Synonyms	*Bacopa monnieria* (L.) Wettst., *Gratiola monnieria* L., *Herpestis monniera* Benth., *Herpestis monnieria* (L.) HBK., *Lysimachia monnieri* L., *Moniera cuneifolia* Michx.	
Common Name	Thyme-leaved Gratiola , Jal Brahmi	
Family	Scrophulariaceae	
Local Names	• sanskruit : Brahmi	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Eclipta alba*	
Common Name	Bhangra	
Family	Asteraceae	
Local Names	• sanskruit : Bhrungaraj	
	• Gujarati : Bhaangro	
	• Hindi : Bhringraj	
	• Marathi : Maka (White)	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : Isabgol	

Species Type	Climber
Botanical Name	*Mucuna pruriens* 
Synonyms	*Carpopogon niveum* Roxb., *Carpopogon pruriens* Roxb., *Dolichos pruriens* L., *Mucuna nivea* (Roxb.) DC., *Mucuna prurita* Hook., *Stizolobium pruriens* (L.) Medikus
Common Name	Kawach
Family	Fabaceae
Local Names	• Marathi : Khaj-kujli - Black
	• Gujarati : Kaucha

Species Type	Herb
Botanical Name	*Trachyspermum ammi* 
Common Name	Carum Ajwain
Family	Apiaceae
Local Names	• Marathi : Owaa
	• Gujarati : Kaucha

Species Type	Tree	
BotanicalName	*Punica granatum*	
Synonyms	*Punica granatum* L.	
CommonName	Anar	
Family	Lythraceae	
Local Names	• Marathi : Dalimb	
	• Gujarati : Daadam	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	Senna occidentalis (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kaasundro	
	• Gujarati : Kaasundro	

ANNEXURE-II : LIST OF BIRDS SPOTTED IN & AROUND MU

A survey was carried out to find the animal diversity in the campus of Marwadi University Rajkot. The survey focused on the diversity of birds, butterfly, Amphibia.

Common name: Spotted owl
Scientific name : Strix occidentalis

Common name: Brahminy kite
Scientific name : Haliastur indus

Common name:
Scientific name :

Common name: Common starling
Scientific name :Sturnus vulgaries

Common name: Kabae
Scientific name : common Myna

Common name: Pond heron
Scientific name : Ardeola

Common name: Woodpecker
Scientific name : Picidae

Common name: common kingfisher
Scientific name : Alcedo atthis

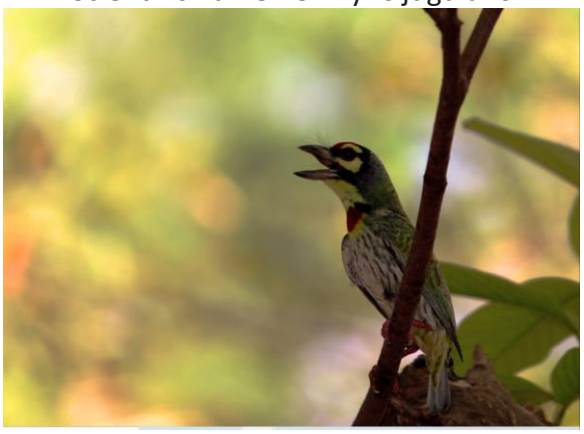
Common name: Purple sunbird
Scientific name : Cinnyris asiaticus

Common name: Common tailorbird
Scientific name : Orthotomus sutorius

Common name: Asian green bee-eater
Scientific name : Merops orientalis

Common name: olive-backed sunbird
Scientific name : Cinnyris jugularis

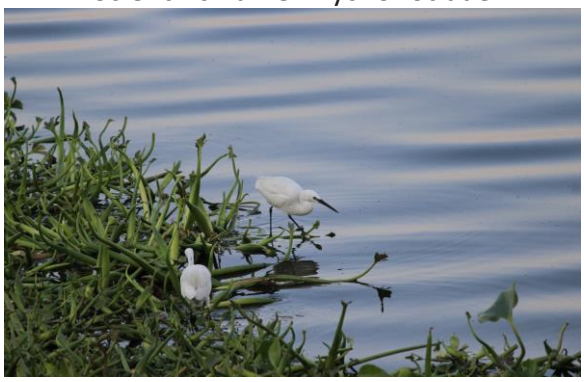
Common name: house sparrow
Scientific name : Passer domesticus



Common name: coppersmith barbet
Scientific name : Psilopogon haemacephalus

Common name: Bulbul
Scientific name : Pycnonotidae

Common name: laughing dove
Scientific name : Streptopelia senegalensis



Common name: Little egret
Scientific name : Egretta garzetta

Common name: Oriental darter
Scientific name : Anhinga melanogaster

Common name: Painted stork
Scientific name : Mycteria leucocephala

Common name:
Scientific name :

Common name: billed pelican
Scientific name : Pelecanus philippensis

Common name: Parrots
Scientific name : Psittaciformes

Common name: Robber flies
Scientific name : Asilidae

Common name: Dragonfly
Scientific name : Anisoptera

Common name:
Scientific name :

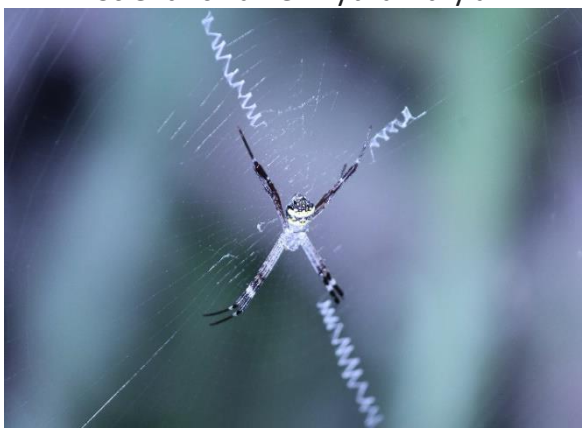
Common name:California sister
Scientific name :Adelpha bredowii

Common name:
Scientific name :

Common name: common tiger
Scientific name : Danaus genutia

Common name: Spotted Joker
Scientific name : Byblia ilithyia

Common name: Blue tiger
Scientific name : Tirumala limniace



Common name: Signature Spider
Scientific name : Argiope anasuja

Common name: button spider
Scientific name : Latrodectus umbukwane

ANNEXURE-III : LIST OF RAPTILES SPOTTED IN & AROUND MU

Scientific name: Rattus rattus
Common Name : House Rat

Scientific name: Calotes versicolor Common Name : Indian Garden Lizard

Scientific name: Hoplobatrachus tigerinus
Common Name : Indian Bull Frog

Scientific name: Naja naja
Common Name : Indian Cobra

Marwadi University
Marwadi Chandarana Group

GREEN AUDIT REPORT

2020-2021

Marwadi University

Rajkot-Morbi Road, Rajkot – 360003
Gujarat, India

Submitted By

Green Audit Team

TABLE OF CONTENTS

ACKNOWLEDGEMENT

Green Audit Assessment Team thanks to the Dean, Marwadi University, Rajkot for assigning the task of Green Audit of the university campus to us. We appreciate the cooperation that we got from all the faculties and students during the entire process. Our special thanks to Prof. (Dr.) Sandeep Sancheti, Provost and Shri Naresh Jadeja, Registrar of the university for their warm support and encouragement from the very beginning till the end of the process.

We are also thankful to the testing and consultancy cell for provided various test report done by them to match requirement of this audit & helping us in collecting different data and analyzing them.

We are also thankful to all the students, faculties and staff for provide help at different level to collect the various details as per the requirement of this green audit.

The entire team is very grateful to the management of Marwadi University for their continuous support and motivation to take various innovative and challenging assignments.

Dr. Tarak Vora
Team Leader
Green Audit Team
Marwadi University. Rajkot

DISCLAIMER

Green Audit Team Has prepare this report on the basis of primary data collected from the different areas of the university. All reasonable care has been takesn in its preparation: details contained in this reprort have been compiled in good faith based on information gathered.

Date: 25/03/2021

Prepared by:
Green Audit Team

1. BRIEF ABOUT MARWADI UNIVERSITY

In 2007-08 the availability of world class academic facilities in the Saurashtra region were sparse; which encouraged Marwadi Group, Rajkot to launch Marwadi Education Foundation's Group of Institutes, offering Technical and Professional UG & PG courses and programs such as B.E, MBA and MCA. Marwadi Education Foundation's Group of Institutions (MEFGI) was incepted as a major organ of Marwadi Education Foundation's Group of Institutions in 2008, under the Bombay Public Trust Act 1950. Marwadi Education Foundation's Group of Institutions is a body promoted by Marwadi Shares & Finance Limited; a major stock broking company in India & Chandarana Intermediaries Brokers Pvt. Ltd. Since its inception Marwadi Education Foundation's Group of Institutions were affiliated with Gujarat Technological University.

Commitment to provide best and industry relevant education received an overwhelming trust from the society and in order to blend Engineering with Science and support them through Management and Law disciplines and have multi disciplinary course offerings in Science, Commerce, Arts, Health and Management, Marwadi Education Foundation proposed to establish "Marwadi University" in the Year 2016. Marwadi University bill was introduced and passed in Gujarat Assembly and Marwadi University was established under Gujarat Private Universities act no. 9 of 2016 on 9th May, 2016.

2. VISION & MISSION OF MARWADI UNIVERSITY

2.1 VISION OF THE UNIVERSITY

Our vision is to address challenges facing our society and planet through sterile education that builds capacity of our students and empower them through their innovative thinking practice and character building that will ultimately manifest to boost creativity and responsibility utilizing the limited natural resources to meet with the challenges of the 21st century

2.2 MISSION OF THE UNIVERSITY

- ✓ To produce creative, responsible and informed professionals.
- ✓ To produce individuals who are digital-age literates, inventive thinkers, effective communicators and highly productive.
- ✓ To deliver cost-effective quality education.
- ✓ To offer world-class, cross-disciplinary education in strategic sectors of economy though well devised and synchronized delivery structure and system, designed to tickle the creative intelligence and enhance the productivity of individuals.
- ✓ To provide a conducive environment that enables and promotes individuals to creatively interact, coordinate, disseminate and examine change, opinion as well as concept that will enable students to experience higher level of learning acquired through ceaseless effort that lead to the development of character, confidence, values and technical skills.

3. GREEN AUDIT

Modernization and industrialization are the two important outputs of the twentieth century that have made human life more luxurious and comfortable. They are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources, and finally making our mother Earth ugly and inhospitable. The time has come to wake up, unite and combat together for a sustainable environment.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, universities, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly university.

3.1 GOALS OF GREEN AUDIT

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To conduct a survey to know the ground reality about green practices.
- To make sure that rules and regulations are taken care of to save environment.
- To avoid the interruptions in environment that are more difficult to handle and whose correction requires higher cost.
- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issues.
- To Identify strengths and weaknesses in green practices.

3.2 BENEFITS OF GREEN AUDIT

- It would help to protect the environment in and around the campus.
- Recognize the cost saving methods through waste minimization and management.
- Empower the organization to frame a better environmental performance.
- Point out the prevailing and fourth coming impacts on environment.
- Recognize the cost-saving methods through waste minimizing and managing.
- Ensures conformity with the applicable laws.
- Empower the organizations to frame a better environmental performance.
- Developing an environmental ethic and value systems in youngsters.
- It portrays a good image of an institution which helps building better relationships with the group of interested parties.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the University.
- It will help to build a positive impression through green initiatives for the upcoming NAAC visit.

4. ENVIRONMENTAL POLICY OF THE UNIVERSITY

Marwadi University, Rajkot always believes in maintaining its own standard in matter of environment and quality consciousness. It has taken number of initiatives to protect its own environment with a pollution free campus.

To create a green cover, Eco-friendly atmosphere, pure oxygen at the university campus, a plantation program is organized every year with active participation from the university community and visitors. Green Audit Team owns responsibility to preserve the work carried out on the campus related to the environment.

This also helps in ensuring that the Environmental Policy is enacted, enforced, and reviewed using various environmental awareness programs.

ENVIRONMENTAL POLICY

Both the teaching and Non-teaching staff of Marwadi University Rajkot are committed for carrying out its activity for sustainable development. This we will achieve through the following :-

i. To educate students and staff on how to appropriately utilize water effectively.
ii. To put the campus' "Rain Water Harvesting" to use.
iii. To make the most of the solar energy generated by the solar panels on the roofs of educational buildings.
iv. To use ICT as much as possible while using paper as little as possible. It will contribute to the "Paperless Office" initiative.
v. Using vermin-compost on the campus to turn solid waste into fertilizer.
vi. To lessen the campus' noise pollution.
vii. To protect and nurture the Flora and Fauna on the campus
viii. To maintain green campus.
ix. To use treated waste water for flushing and gardening purpose.
x. To use recycle the waste material and make them usable.

5. CONSTITUTION FOR GREEN AUDIT

The Green Audit is carried out as per the environmental policy of the Green audit checklist. The aim of the audit is to check the existing practices and provide advice for the development of environmental policy and practice in the areas of:

- ✓ Waste management
- ✓ Management water conservation and management
- ✓ Tree plantations
- ✓ Bio-diversity and threatened/ endangered species
- ✓ Preservations Energy use and conservations
- ✓ Eco-friendly campus
- ✓ Green environment and clean campus
- ✓ Spread environmental awareness
- ✓ Educate the people about sustainability

MEMBERS OF GREEN AUDIT TEAMS

Sr. No.	Name of Auditor	Designation
1	Dr. Tarak Vora	Team Leader
2	Dr. Abhishek Gupta	Member
3	Dr. Archana Sharma	Member
4	Dr. Nitinkumar Singh	Member
5	Dr. Hirendrasinh Padhiyar	Member
6	Mrs. Bhavna Thummar	Member
7	Mr. Raj Chapala	Member
8	Mr. Jyupil Joshi	Member
9	Mr. Devesh Poorey	Member
10	Mr. Ravi Modi	Member
11	Mr. Sachin Parmar	Member
12	Mr. Kalpesh Chandarana	Member

6. OBJECTIVES OF THE STUDY

The green audit's primary goal is to support environmental management and conservation on college campuses. According to the relevant laws, rules, and standards, the audit's goal is to identify, measure, explain, and prioritise the framework for environmental sustainability. The following are the primary goals of doing a green audit:

- ✓ To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use on the campus.
- ✓ To establish a baseline data to assess future sustainability by avoiding the interruptions inenvironment that are more difficult to handle and their corrections requires high cost.
- ✓ To bring out a status report on environmental compliance

7. METHODOLOGY

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered thefollowing areas to summarise the present status of environment management in the campus

- ➢ **Water management**
  - ✓ Raw Water
  - ✓ Drinking Water
  - ✓ Waste Water
  - ✓ Sewage Water
  - ✓ Rain Strom Drain Water
- ➢ **Energy Conservation**
  - ✓ Petrol
  - ✓ Diesel
  - ✓ LPG
  - ✓ Electricity

- **Waste management**
  - ✓ Domestic Waste Management
  - ✓ Grass Waste Management
  - ✓ Food Waste Management
  - ✓ Fiscal Waste Management

8. FOCUS AREA OF AUDIT

To match with the objective of the green audit, following areas are kept under the scope of the audit.

1. Water management
2. Air Pollution Management
3. Noise Pollution Management
4. Energy use & conservation
5. Waste Management
6. Green belt area & Bio-diversity
7. Environmental Awareness initiative

8.1 WATER MANAGEMENT

Water is a valuable natural resource for all living organisms. It is freely available depending on the climate and topographic features of a region. Water is a precious natural national resource available with a fixed quantum. The availability of water is decreasing due to the increasing population of the nation; as per capita availability of utilized water is going down.

Even though it is naturally present, drinking water that is portable is not easily available for human consumption. Just 3% of the water on our planet, which covers 70% of its surface, is fresh water. The world's 1.1 billion inhabitants are experiencing a water crisis. Water issue is greatly impacted by water pollution and waste. An alarming amount of water is being contaminated. Water contamination can cause a variety of illnesses or even death. Because of this, it's crucial to make sure that drinking water is sterile, clean, and free of germs and illnesses. Also, it's crucial to manage, protect, and conserve water resources so that they may be used sustainably. The use and quality of water on the university campus are being studied by our institution. Water auditing is done to assess raw water intake facilities and identify facilities for water treatment and reuse. The concerned auditor looks at the appropriate approach that may be used to balance the supply and demand for water.

USES AND MANAGEMENT

SOURCE OF WATER

Sr. No.	Resource	Quantity
1	GWI (Narmada WATER)	-----
2	No of Open Well	02
3	No of Bore-well	03
4	Water reserve - Underground Tank	4 Lakh liters

WATER USERS IN CAMPUS

Sr. No.	Person in different section	Strength (No. of person - Approx)
1	Staff	450
2	Hostel Boarders	1400
3	Residential Family Members	40
4	Visitors	2000
5	Construction Labour	125

The visitors of the college vary with respect to different activities conducted in the college campus. During admission and different competitive exam conducted in the college campus. The total number of visitors of the college increases up to 2000 on such day.

WATER CONSUMPTION IN DIFFERENT ACTIVITYIN COLLEGE CAMPUS

Activity	Water used per activity (in Litter)	No. of times Activity performed in a day	Average water used Person/Day	No. of people using water	Total water consumption per Day
Hand and face wash	4-6 L	4	16-24L	1550	31000
Drinking Water	0.2-0.4L	6	1.2-2.4L	1550	2790
Toilet Flush	8-10L	4	32-40L	1550	55800
Bath	30-40 L	1	30-40 L	1550	54250
Cooking & Washing In resident	150-250L	2	300-500L	40	16000
Cooking & Washing Hostel	10-15L	4	40-60L	1550	77500
Total					237340

WATER QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : DRINKING WATER

Test Report No / Ref.No. :- TA-421 **Date: 10-1-2021**

Name of Customer	Marwadi University, Rajkot
Address of Customer	Rajkot - Morbi Highway, Gauridad.
Environmental Condition	Ambient
Date of Sample Collection	5/1/2021
Nature of Sample	Colour: Colour less
Sample Quntitiy	100 ml
Packing Type	Plastic bottle
Type of Sampling	Grab
Sample Collected By	Mr. Kalpesh Parmar
Date of analysis starts	6/1/2021
Analysis conclude on	10/1/2021

Sr. No.	Parameters	Units	Test Method	Permissible Limit	Hostel-A	Hostel-B	Hostel-C	Hostel-D	Inter-national Canteen
1	**pH**	-	APHA 23rd Ed.,2017,4500-H+B	6.5 - 8.5	7.06	7.28	7.22	7.41	7.36
2	**TDS**	mg/L	APHA 23rd Ed. Method 2540-C	500	74	85.3	97.6	142	102
3	**Turbidity**	FNU	APHA 23rd Edition 2130-B(Page No.2-13)	1	0.52	0.48	0.51	0.48	0.44
4	**Conductivity**	µs/cm	APHA 23rd Ed. Titration Method 2510-B	200-800	202.4	199.8	206.4	322	204
5	**Chloride**	mg/L	APHA 23rd Ed 4500-Cl- B (Page No.4-75)	250	41	40	40	54	43
6	**Total Hardness**	mg/L	APHA 23rd Ed. Method 2510-B	200	64	52	76	148	122

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied,.BDL= Below Detection Limit, MDL = Minimum Detection Limit
2. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
3. This office is not responsible for the authenticity for the samples not collected by our officials.
4. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
5. Permissible Limits: as per Schedule VI of EPA Rules-1986
*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

End of Report

Dr. Nitin Kumar Singh
Testing Incharge

Dr. Tarak Vora
Quality Manager

STP TREATED WATER QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : STP WATER SAMPLES	
Test Report No / Ref.No. :- TA-401	**Date: 06-12-2020**
Name of Customer	Marwadi University
Address of Customer	Rajkot - Morbi Highway, Gauridad.
Date of Sample Collection	01-12-2020
Sample Collected By	Mr. Deepak bhai
Sample Tested By	Mr. Raj Chapala, Mr. Avon Dobariya & Mr. Jitesh Joshi
Date of analysis starts	02-12-2020
Analysis conclude on	06-12-2020

Sr. No.	Parameters	Units	Test Method	Acceptable Limit	Inlet	Treated Water (Before Filtration)	Treated Water (After Filtration)
1	pH	-	APHA 23rd Ed.,2017,4500-H+B	6.5-8.5	7.21	7.48	7.25
2	BOD	mg/L	APHA 23rd Ed. Method 2540-C	30	123	87	54
3	COD	mg/L	APHA 23rd Edition 2130B	100	188	112	54
4	TSS	mg/L	APHA 23RD Edition 2540 D	100	118.7	88.8	45.7
5	Turbidity	FNU	APHA 23rd Edition 2130-B	5	18.8	8.1	2.3
6	Oil and Grease	mg/L	APHA 23RD Edition 5520 G	10	15.8	12.3	3.6
7	Ammonical Nitrogen	mg/L	APHA 23RD Edition 4500-NH3 C	5	11.2	3.05	2.2

*NOTE

1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

Testing Incharge

Team Leader

OBSERVATIONS IN REGARD OF WATER USAGES AND CONSERVATION PLAN

1. Treated water is used for flushing through dual plumbing system installed in all the buildings.
2. The garden is watered using sprinklers and drip irrigation system installed throughout the campus.
3. Drinking water quality is being tested regularly as per plan.
4. Law flow water fixtures are installed in bathroom and toilets.
5. Water level sensors are installed in the water tank for overflow cutoff.
6. Rainwater harvesting is done in the lake created in the campus.
7. Rainwater is being recharged in the bore.
8. Displays about the saving water are placed at various locations in the campus.

8.2 AIR POLLUTION MANAGEMENT

PERIODIC AWARENESS PROGRAMME FOR STAFF, STUDENTS AND SOCIETY

The university has consistently run programmes to raise staff, student, and societal awareness of the need to preserve and conserve the environment. Moreover, programmes and rallies on different environmental and health-related topics are organised in order to raise awareness. Students and professors at the university participate in NSS/NCC-related events.

A) MASS TRANSPORTATION FACILITY

As such campus is not generating any air pollution by its own activity except it has its own transportation department. Faculties and students of the university are motivated to use mass transportation system. Faculties are given some advantages for use of the bus facility provided by the university.

Regular maintenance of all the buses are planned and executed so that their milage as well as emission would remain efficient.

All the office bearer are motivated to use the university vehicles on sharing basis. It has been mandated unless and until its an emergency do not use university vehicles for single persons.

AIR QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : AMBIENT AIR	
Name of Customer	Marwadi University
Address of Customer	Rajkot - Morbi Highway, Gauridad.
Environmental Condition	Satisfactory
Date of Sample Collection	07-10-2020
Nature of Sample	Colour : Colour Less
Sample Collected By	Jyupil Joshi
Sample Tested By	Raj Chapala
Date of analysis starts	08-10-2020
Analysis conclude on	09-10-2020

Sr. No.	Parameters	Units	Test Method	Permissible Limit	MAIN BUILDING
1	PM_{10}	($\mu g/m^3$)	IS 5182 (Part 23) (1999, Reaffirmed 2010)	100	41.35
2	$PM_{2.5}$	($\mu g/m^3$)	NAAQMS/36/2012-13	60	12.59
3	SO_2	($\mu g/m^3$)	IS 5182 (Part 2)	80	1.38
4	NO_X	($\mu g/m^3$)	IS 5182 (Part 6)	80	2.58

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL = Minimum
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

Testing Incharge

Team Leader

STACK ASSESSMENT REPORT

ANALYSIS REPORT : STACK : DG SET					
Test Report No / Ref.No. :- TA-422					**Date:- 19-01-2021**
Name of Customer	Marwadi University, Rajkot				
Address of Customer	Rajkot - Morbi Highway, Gauridad.				
Temperature	31°C				
Weather Condition	Satisfactory				
Date of Sample Collection	18-01-2021				
Nature of Sample	Colour : Colour Less				
Sample Collected By	Dr. Tarak Vora, Mr. Jitesh Joshi & Mr. Jyupil Joshi				
Date of analysis starts	18-01-2021				
Analysis conclude on	19-01-2021				
Sr. No.	**Parameters**	**Units**	**Test Method**	**Permissible Limit**	**DG Set**
				Stack Height In Meter	**10**
1	**PM**	mg/Nm^3	IS 11255 (Part 1)	150	45.8
2	**SO_2**	ppm	IS 11255 (Part 2)	100	29.3
3	**NO_x**	ppm	IS 11255 (Part 7)	50	22.8

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit

End of Report

Dr. Nitin Kumar Singh
Testing Incharge

Dr. Tarak Vora
Quality Manager

8.3 NOISE POLLUTION MANAGEMENT

A) SILENCE ZONES IN THE UNIVERSITY

For awareness of the need to preserve silence at the institution, several display boards have been put up in the library and other locations.

B) NOISE CONTROL IN THE UNIVERSITY

The institution has enacted a no honking policy that forbids the use of any noise on campus, including honking.

On college campuses, noise pollution is maintained to a minimum and designated quiet zones are established in places like the library and classrooms.

C) DG SET FOR POWER BACK-UP

Every time there is a power outage because of load shedding or maintenance on the college campus, the college uses its DG backup system. Noise monitoring of the stack of DG set is being done on regular basis.

NOISE LEVEL ASSESSMENT REPORT

ANALYSIS REPORT : NOISE			
Name of Customer		Marwadi University	
Address of Customer		Rajkot - Morbi Highway, Gauridad.	
Environmental Condition		Satisfactory	
Date of Sample Collection		01-12-2020	
Sr. No.	**Location**	**Permissible limit**	**Day (dB-A)**
1	**Main Gate**	65	61
2	**PG Building**		54
3	**Hostel Aera**		51
4	**Main Canteen**		55
5	**New Canteen**		52

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit

Testing Incharge

Team Leader

8.4 ENERGY USE AND CONSERVATION

Energy use, energy sources, energy monitoring, lights, appliances, natural gas, and cars are all included by this indication. Energy usage is obviously a crucial component of campus sustainability, therefore its inclusion in the assessment needs no justification.

Following Energy Sources are used in the college

- ✓ Electrical
- ✓ Diesel
- ✓ Petrol
- ✓ LPG

OBSERVATIONS

- University has installed electrical meters at various locations to understand the power usage pattern.
- University is doing energy audit on yearly basis as per the planned schedule.
- University is in the installation stage for 650 kVA rooftop solar panel within the campus. This meets almost 50% of its total demand.
- Sensor based lights are installed in the main building.
- University it converting all the lights to the LED lights phase wise as per the plan.

8.5 WASTE MANAGEMENT

Waste management is the managing of waste by disposal and recycling of it. Moreover, waste management needs proper techniques keeping in mind the environmental situations. For instance, there are various methods and techniques by which the waste is disposed of. Some of them are Landfills, Recycling, Composting, etc. Furthermore, these methods are much useful in disposing of the waste without causing any harm to the environment. Waste management is a very crucial aspect of any of the organization. Marwadi university campus is spreaded over 42 acres of land where it is dealing with different types of waste as listed below.

- ✓ Domestic waste
- ✓ Food waste
- ✓ Green waste

- ✓ Fiscal waste

OBSERVATIONS

SEGREGATION OF DOMESTIC WASTE

Colour coded dustbins are installed. Three separate dustbins, near each block for disposal of different types of wastes. All the segregated wastes are dumped in the particular dustbins of green, blue, yellow colour.

- ✓ The wet and biodegradable wastes are dumped in green dustbin. For e.g.: kitchen wastes including vegetables and fruits skins.
- ✓ Disposal of plastic wrappers and non-biodegradable wastes are meant for blue coloured dustbin.
- ✓ Papers and glass bottles are disposed in yellow dustbins
- ✓ Cleaning or emptying of the dustbins is being done on a regular basis at an allocated time.

200 kLD STP PLANT

Recycling of water is the crucial thing when water consumption is high in the organization. University has setup a 200 kLD Sewage Treatment Plant in the campus. Treated water is being used for gardening purpose. Excess treated water is used in the flushing as all the buildings are installed with dual plumbing system to utilized treated water in flushing.

RECYCLING OF WASTE

Vermicomposting is a method of making compost, with the use of earthworms, which generally live-in soil, eat biomass and excrete it in digested form. This compost is generally called vermicompost or Wormicompost. Marwadi University has prepared the composting beds for converting grass waste into the compost. Compost produced through the beds are distributed to the students and faculties of the campus.

INSTALLATION OF BIOGAS PLANT

University has installed 45 CUM capacity biogas plant within the campus. Where the combination of cow dung, food waste and grass waste is used as raw material. Biogas produced from the plant is utilized for cooking in the hostel canteen.

8.6 GREEN BELT AREA & BIO-DIVERSITY

The Green Belt Area is intended to preserve the environment and enhance the visual value of the college grounds. To guarantee that the structures adhere to green standards, the college's green area consists of the campus's vegetation, greenery, and sustainability. Also, by implementing various environmental awareness programmes, this aids in ensuring that the Environmental Policy is adopted, implemented, and evaluated.

OBSERVATIONS

The campus is close to over 60 different types (species) of flora and animals. Via the NSS unit, several tree planting initiatives are held during the months of July and August on college campuses and in the nearby communities. This initiative aids in promoting an eco-friendly atmosphere that gives the institute pure oxygen and raises awareness among the communities. The planting initiative comprises a variety of native decorative and therapeutic plants. The occurrence of similar species planted, such as "NEEM," is noted rather than sustaining biodiversity. Neem, Indian Blackberry Tree, Flame Tree, Mango Tree, Jack Fruit Tree, Teak, and Spanish Cherry Plant are the predominant species in the green belt.

8.7 ENVIORNMENTAL AWARENESS INITIATIVES

Marwadi University regularly educates employees and faculty on how to use bicycles, how to use paper responsibly, and how to establish a plantation aim. Some of the steps done include the display of environmental protection banners, signs encouraging people to save electricity and water in prominent locations, and garbage disposal containers for both wet and dry waste.

9. EXECUTIVE SUMMERY & RECOMMENDATIONS

The university has created a green environmental policy and is working to promote sustainable growth on the campus. The university has created a team of academics and students that works to preserve biodiversity on the campus and contributes to efforts to reduce pollution in society. The university intends to add environmental management and protection to its curriculum. The university has given faculty and students workshops and trainings on environmental awareness. Law flow water fixtures are installed in the campus. Campus have planned for waste management and taken initiatives towards recycling of waste. Green audit has also covered energy parameters also in the observation this time; however, detailed energy audit is being conducted by electrical department on yearly basis.

It is also verified that the initiatives on almost all the recommendations of the previous year have been taken by the university which are found satisfactory.

GOOD POINTS OBSERVED

- ✓ The university has formed a policy on green environmental and contributing to promote sustainable growth on the campus.
- ✓ A team is formed by the university including a team of academicians and students that works to preserve and improve biodiversity on the campus. Contributions have been made by the team to reduce pollution in society.
- ✓ It is planned to install solar panel to cover almost 50% of the power requirement of the campus.
- ✓ Environmental awareness and education programs are conducted by the university on regular basis.
- ✓ Five beds for vermicomposting has been set up at the university to spread awareness about waste conversion and utilization as well as for research.

RECOMMENDATIONS

1. Environmental awareness and education should be scaled up in a planned manner.
2. Plan for green belt development to be prepared
3. Awareness for energy and water conservation among students and staff by displaying boards.
4. Installation of solar panel should done be done on priority basis.
5. Watering schedule to be planned according the season

ANNEXURE I : LIST OF TREES & PLANTS SPOTTED IN & AROUND MU

A survey was carried out to find plant diversity in the campus of Marwadi University. The survey was focused on the diversity of plants and trees on the basis of their classification and economic importance.

Species Type	Tree	
Botanical Name	*Bauhinia purpurea*	
Common Name	Butterfly Tree, geranium Tree	
Family	Fabaceae Caesalpinioideae	
Local Names	• Gujarati: Hadayparni	
	• Sanskrit : Kanchanar (red)	

Species Type	Tree	
Botanical Name	Azadirachta indica	
Synonyms	*Antelaea indica* (L.) Adelb., *Melia azadirachta* L., *Melia indica* (A. Juss.) Brandis	
Common Name	Neem	
Family	Meliaceae	
Local Names	• Hindi :	Neem
	• Gujarati :	Limbado , Kadavo Limbado
	• Sanskrit :	Nimba

Species Type	Tree	
Botanical Name	Khaya senegalensis	
Common Name	Senegal Mahogany, African Mahogany, Senegal Khaya	
Family	Meliaceae	
Local Name	• Gujarati: Khaya	

Species Type	Tree	
Botanical Name	Spathodea campanulata	
Common Name	*African tulip tree*	
Family	Bignoniaceae	
Local Names	• Gujarati: Tulip tree	

Species Type	Tree	
Botanical Name	Samanea saman	
Common Name	Saman,Pukul Lima, Cow Tamarind, Hujan-Hujan, East Indian Walnut, Monkey, rain tree	
Family	Fabaceae (alt. Mimosaceae), legume family	
Local Names	• Gujarati: *Shirish,*	
	• Sanskrit :*Shiriisha*	

Species Type	Tree	
Botanical Name	*Terminalia mantaly*	
Common Name	Madagascar Almond, Umbrella Tree	
Family	Combretaceae	
Local Names	• Gujarati: African tree	

Species Type	Tree	
Botanical Name	Alstonia scholaris	
Common Name	Scholar Tree, Dita bark, Devil tree, Blackboard Tree	
Family	Apocynaceae	
Local Names	• Gujarati: *Saptaparni*	
	• Sanskrit :Saptaparna	
Uses	Medicinal uses: ⚠Its bark, known as Dita Bark, is used in traditional medicine to treat dysentery and fever. In Ayurveda it is used as a bitter and as an astringent herb for treating skin disorders, malarial fever, urticaria, chronic dysentery, diarrhea, in snake bite and for upper purification process of Panchakarma . The Milky juice of the tree is applied to ulcers.	

Species Type	Tree	
Botanical Name	Lagerstroemia speciosa	
Common Name	Giant crepe-myrtle, Queen's crepe-myrtle, banabá plant, or pride of India	
Family	Bignoniaceae	
Local Names	• Gujarati: Jarul, Moto Bhondar	
	• Sanskrit : Syandana	

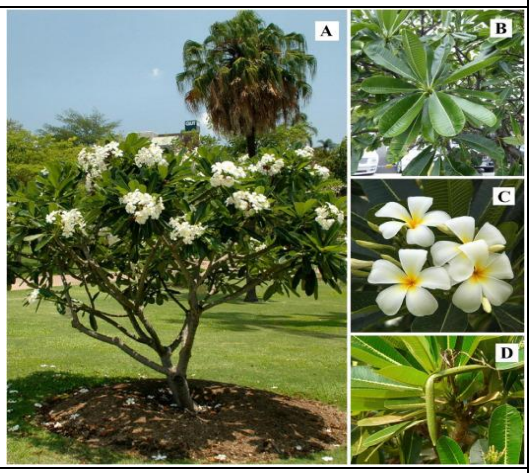
Species Type	Tree	
Botanical Name	Senna siamea	
Common Name	kassod tree, cassod tree and cassia tree	
Family	Fabaceae	
Local Names	• Gujarati: kashid tree	

Species Type	Tree	
Botanical Name	Delonix regia	
Common Name	*Flame Tree, Royal Poinciana*	
Family	Fabaceae	
Local Names	• Gujarati: Gulmohar	
	• Sanskrit : Raj abharan tree, Krishna chud tree	

Species Type	Tree	
Botanical Name	Tabebuia rosea	
Common Name	Salvador Pink Trumpet Tree	
Family	Bignoniaceae	
Local Names	• Gujarati: Vasant Rani	

Species Type	Tree	
Botanical Name	*Cassia fistula*	
Common Name	Golden shower tree, Amaltas	
Family	Fabaceae	
Local Names	• Gujrati: Garmalo	
	• Sanskrit : Aragwadha	
Uses	specially used in joint pain, migraine, chest pain and blood dysentery. Amaltas root is also useful in fever, heart diseases, retained excretions and biliousness. It is also used in cardiac disorders biliousness, rheumatic condition, haemorrhages, wounds, ulcers and boils and various skin diseases.	

Species Type	Small Tree	
Botanical Name	Melaleuca citrina	
Common Name	Bottlebrush, crimson bottlebrush, or lemon bottlebrush tree	
Family	Myrtaceae	
Local Names	• Gujarati: Cheel	

Species Type	Small Tree (flower)	
Botanical Name	Plumeria Alba	
Common Name	Champa, Gulchin	
Family	Apocynaceae	
Local Names	• Gujarati: Champa	

.

Species Type	Tree	
Botanical Name	Mimusops elengi	
Common Name	Borsalli, Bakul, Spanish Cherry	
Family	Sapotaceae	
Local Names	• Gujarati: Borsali	
	• Sanskrit :Bakul	
Uses	The bark, flowers, fruits, and seeds of *Bakula* are used in Ayurvedic medicine in which it is purported to be astringent, cooling, anthelmintic, tonic, and febrifuge. It is mainly used for dental ailments such as bleeding gums, pyorrhea, dental caries, and loose teeth	

Species Type	Tree (Fruit)	
Botanical Name	Achras sapota/Manilkara zapota	
Common Name	Chiku, Sapodilla, Sauh Menila, Naseberry, Nispero, Chicle, Chicle Gum, Ciku	
Family	Sapotaceae.	
Local Names	• Gujarati: Chiku	
	• Sanskrit : Vikootam	

Species Type	Shrub (flower)	
Botanical Name	(Rosa rubiginosa ,Rosa indica, *Rosa grandiflora*; Rosa bonica; Rosa floribunda; Rosa gallicanae; Rosa pimpinellifoliae)	
Common Name	Rose, Gulab, rosa	
Family	Rosaceae	
Local Names	• Gujarati: Gulab	

Species Type	Palm	
Botanical Name	Hyophorbe lagenicaulis	
Common Name	Royal palm	
Family	Arecaceae	
Local Names	• Gujarati: *bottle palm*	

Species Type	Shrub	
Botanical Name	*Lawsonia inermis*	
Synonyms	*Lawsonia alba* lam., *Lawsonia spinosa* L.	
Common Name	Mehandi	
Family	Lythraceae	
Local Names	• Marathi : Mehendi	
	• Gujarati : Mehndi	

Species Type	Shrub	
Botanical Name	*Datura metel*	
Synonyms	*Datura fastuosa* L., *Datura fastuosa* var. *alba* (Nees) C.B. Clarke	
Common Name	Dhattura	
Family	Solanaceae	
Local Names	• Marathi : Dhotra - Black	
	• Gujarati : Dhaturo	

Species Type	Shrub	
Botanical Name	*Rauvolfia tetraphylla*	
Synonyms	*Rauvolfia canescens* L., *Rouvolfia tomentosa* Jacq., *Rauvolfia tetraphylla* L.	
Common Name	Bara Chand	
Family	Apocynaceae	
Local Names	• Gujarati : Sarpagandha	

Species Type	Shrub	
Botanical Name	*Mimosa pudica*	
Synonyms	Touch me not	
Common Name	Ail	
Family	Fabaceae - Mimosoideae	
Local Names	Gujarati : lajawni	

Species Type	Tree	
Botanical Name	*Bauhinia variegata*	
Synonyms	*Bauhinia candida* Roxb.	
Common Name	*Mountain ebony*, Kachnar	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kanchnar	
	• Sanskrit Kanchanar (white)	

Species Type	Tree	
BotanicalName	*Bixa orellana*	
Synonyms	*Bixa orellana* L.	
CommonName	Sindhuri	
Family	Bixaceae	
Local Names	• Marathi : Shenduri	

Species Type	Tree	
Botanical Name	Butea monosperma	
Synonyms	*Butea frondosa* Koening ex Roxb., *Erythrina monosperma* Lam., *Butea monosperma* L.	
Common Name	Palas	
Family	Fabaceae-Papilionioideae	
Local Names	• Marathi : Palas, khakra	
	• Gujarati : Khaakhro	
	• Hindi : Palash	

Species Type	Tree	
Botanical Name	*Eucalytus globulus*	
Synonyms	*Eucalyptus gigantea* Dehn., *Eucalyptus glauca* DC., *Eucalyptus perfoliata* Desf., *Eucalyptus pulverulenta* Link	
Common Name	Australian gum Tree, Eucalyptus	
Family	Myrtaceae	
Local Names	• Marathi : Nilgiri	
	• Gujarati : Nilgiri	

Species Type	Tree	
Botanical Name	*Nyctanthes arbo-tristis*	
Synonyms	*Bruschia macrocarpa* Bertol., *Nyctanthes arbor-tristis* var. dentata Hort.ex Moldenke, *Nyctanthes dentata* Blume, *Nyctanthes tristis* Salisb., Parilium arbor-tristis Gaertn., *Scabrita triflora* L.	
Common Name	Night jasmine, Harshingar	
Family	Nyctanthaceae	
Local Names	• Sanskrit : Parijata	
	• Gujarati : Paarijaat	

Species Type	Tree	
Botanical Name	*Peltophorum pterocarpum*	
Synonyms	*Caesalpinia gleniei* Thwaites, *Caesalpinia inermis* Roxb., Inga pterocarpa DC., *Peltophorum ferrugineum* (Decne) Benth., *Peltophorum inerme* (Roxb.) Llanos, *Peltophorum roxburghii* (G.Don) Degener, *Poiciana roxburghii* G.Don	
Common Name	Yellow gold mohur	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Taamraparni	

Species Type	Tree
Botanical Name	*Cocos nucifera* 
Common Name	Coconut palm
Family	Arecaceae
Local Names	• Marathi : Naral
	• Gujarati :Nariyeli

Species Type	Tree	
Botanical Name	*Ficus religiosa*	
Synonyms	Urostigma religiosum (L.) Gasparrini	
Common Name	Bot-Tree, Pipal	
Family	Moraceae	
Local Names	• Marathi : Pimpal	

Species Type	Tree	
Botanical Name	*Mangifera indica* L.	
Synonyms	*Mangifera indica* L.	
Common Name	Aam	
Family	Ancardiaceae	
Local Names	• Marathi : Amba	

Species Type	Tree	
Botanical Name	*Murraya Koenigii*	
Synonyms	*Bergera koenigii* L., *Chalcas koenigii* (L.) Kurz, *Murraya foetidissima* Teijsm. & Binnend, *Murraya koenigii* (L.) Spreng	
Common Name	Indian curry leaf Tree, Mitha neem	
Family	Rutaceae	
Local Names	• Marathi : kadhi patta	
	• Gujarati: Mitho Limdo	

Species Type	Tree	
Botanical Name	*Saraca indica*	
Common Name	Asoka	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : ashok	
	• Gujarati : Ashok	

Species Type	Tree	
Botanical Name	*Tamarindus indica*	
Synonyms	*Tamarindus occidentalis* Gaertn., *Tamarindus officinalis* Hook.	
Common Name	Tamarind Tree, Imli	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Chinch	
	• Gujarati : Khaati Amli	

Species Type	Herb	
Botanical Name	*Aloe barbadensis*	
Synonyms	*Aloe abyssinica* Lam., *Aloe chinensis* Baker, *Aloe indica* Royle, *Aloe littoralis* Koenig ex Baker, *Aloe vera* (L.) Burm.f., *Aloe vulgaris* Lam., *Alpinia allhugas* Roscoe, *Aloe barbadensis* Mill.	
Common Name	Aloe	
Family	Liliaceae	
Local Names	• Marathi :Korphad	
	• Gujarati : Ghrutakumari	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	*Senna occidentalis* (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Kaasundro	

Species Type	Herb	
Botanical Name	*Catharanthus roseus*	
Synonyms	*Lochnera rosea* (L.) Reichb., *Vinca rosea* L.*, Catharanthus roseus* (L.) G. Don	
Common Name	Sadabahar	
Family	Apocynaceae	
Local Names	• Marathi : Sadaphuli	

Species Type	Herb	
Botanical Name	*Cymbopogon citratus*	
Synonyms	*Andropogon citratus* DC., *Cymbopogon citratus* (DC.) Stapf	
Common Name	Lemon grass, Gandh-ghas	
Family	Poaceae	
Local Names	• Gujarati : Lili-cha	

Species Type	Herb	
Botanical Name	*Elettaria cardamomum*	
Common Name	Elaichi	
Family	Scitaminaceae	
Local Names	• Marathi : elaichi	

Species Type	Herb	
Botanical Name	*Mentha piperita*	
Common Name	Peppermint	
Family	Lamiaceae	
Local Names	• Marathi : Pudina	
	• Gujarati : Pudino	

Species Type	Herb	
Botanical Name	*Mimosa pudica*	
Synonyms	*Mimosa pudica L*.	
Common Name	Touch-me-not	
Family	Fabaceae-Mimosoideae	
Local Names	• Marathi : Lajwanti	
	• Gujarati : Lajaamni	

Species Type	Herb	
Botanical Name	*Ocimum basilicum*	
Common Name	Babui tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Sabja, tulas	
	• Gujarati : Damro	

Species Type	Herb	
Botanical Name	*Ocimum sanctum*	
Synonyms	*Ocimum inodurum* Burm.	
Common Name	Tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Krishna Tulas	
	• Gujarati : Vishnu Tulsi	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : isabgula	

Species Type	Herb	
Botanical Name	*Rauvolfia serpentina*	
Synonyms	*Ophioxylon album* Gaertn., *Ophioxylon serpentium* L., *Ophioxylon trifoliatum* Gaertn., *Rauvolfia trifoliata* (Gaertn.) Baill., *Rauvolfia serpentina* (L.) Benth. ex Kurz	
Common Name	Sarpagandha, chota chand	
Family	Apocynaceae	
Local Names	• Marathi : Sarpagandha	
	• Sanskrit: Sarpagandha	

Species Type	Herb	
BotanicalName	*Solanum surattense*	
Synonyms	*Solanum mccanni* Sant., *Solanum xanthocarpum* Schrad. & Wendl.	
CommonName	Kantakari, Kateli	
Family	Solanaceae	
Local Names	• Gujarati : Kantkari	

Species Type	Herb	
Botanical Name	*Swertia chirata*	
Common Name	Kiryata	
Family	Gentianaceae	
Local Names	• Gujarati : chirata	

Species Type	Herbs	
Botanical Name	*Zingiber officeinale*	
Common Name	Adrak	
Family	Zingiberaceae	
Local Names	• Marathi : Adrak	
	• Gujarati : adu	

Species Type	*Shrub*	
Botanical Name	*Withania somnifera*	
Synonyms	*Physalis flexuosa* L., *Physalis somnifera* L., *Withania somnifera* (L.) Dunal.	
Common Name	Ashwagandha	
Family	Solanaceae	
Local Names	• Marathi : Ashwagandha	
	• Gujarati : Ashwagandha	

Species Type	*Herb*	
Botanical Name	Kalanchoe pinnata	
Synonyms	• Bryophyllum pinnatum (Lam.) Oken. • Bryophyllum calycinum Salisb. • Cotyledon pinnata Lam.	
Family	Crassulaceae	
Local Names	• Gujarati : patthar-chatti	
	• Sanskrit :	

Species Type	Climber	
Botanical Name	*Asparagus racemosus*	
Synonyms	*Asparagus racemosus* Willd	
Common Name	Satavari	
Family	Liliaceae	
Local Names	• Marathi : Shatavari	
	• Gujarati : Shatavari	

Species Type	Shrub	
Botanical Name	*Adhatoda vasica*	
Synonyms	*Adhatoda vasica* Nees	
Common Name	Malabar nut	
Family	Acanthaceae	
Local Names	• Marathi :	
	• Gujarati :	

Species Type	Tree	
Botanical Name	*Pongamia pinnata*	
Common Name	Indian beach	
Family	Fabaceae-Papilionioideae	
Local Names	• Marathi : Karanj	
	• Gujarati : Karanj	

Species Type	Climber	
Botanical Name	*Tylophora indica*	
Synonyms	*Asclepias asthmatica* L. f., *Cynanchum bracteatum* Thunb., *C. indicum* Burm. f., Hoya hirsuta Moon. *Tylophora asthmatica* (L.f.) Wight & Arn.	
Common Name	Indian ipecacuanha	
Family	Asclepiadaceae	
Local Names	• Marathi : Damvel	
	• Gujarati : Damvel	

Species Type	Climber	
Botanical Name	*Piper longum*	
Synonyms	*Chavica roxburghii* Miq., *Piper longum* L.	
Common Name	Indian long pepper, Pipal	
Family	Piperaceae	
Local Names	• Marathi : Lendi pimpli	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Bacopa monnieri*	
Synonyms	*Bacopa monnieria* (L.) Wettst., *Gratiola monnieria* L., *Herpestis monniera* Benth., *Herpestis monnieria* (L.) HBK., *Lysimachia monnieri* L., *Moniera cuneifolia* Michx.	
Common Name	Thyme-leaved Gratiola , Jal Brahmi	
Family	Scrophulariaceae	
Local Names	• sanskruit : Brahmi	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Eclipta alba*	
Common Name	Bhangra	
Family	Asteraceae	
Local Names	• sanskruit : Bhrungaraj	
	• Gujarati : Bhaangro	
	• Hindi : Bhringraj	
	• Marathi : Maka (White)	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : Isabgol	

Species Type	Climber
Botanical Name	*Mucuna pruriens* 
Synonyms	*Carpopogon niveum* Roxb., *Carpopogon pruriens* Roxb., *Dolichos pruriens* L., *Mucuna nivea* (Roxb.) DC., *Mucuna prurita* Hook., *Stizolobium pruriens* (L.) Medikus
Common Name	Kawach
Family	Fabaceae
Local Names	• Marathi : Khaj-kujli - Black
	• Gujarati : Kaucha

Species Type	Herb
Botanical Name	*Trachyspermum ammi* 
Common Name	Carum Ajwain
Family	Apiaceae
Local Names	• Marathi : Owaa
	• Gujarati : Kaucha

Species Type	Tree	
BotanicalName	*Punica granatum*	
Synonyms	*Punica granatum* L.	
CommonName	Anar	
Family	Lythraceae	
Local Names	• Marathi : Dalimb	
	• Gujarati : Daadam	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	Senna occidentalis (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kaasundro	
	• Gujarati : Kaasundro	

ANNEXURE-II : LIST OF BIRDS SPOTTED IN & AROUND MU

A survey was carried out to find the animal diversity in the campus of Marwadi University Rajkot. The survey focused on the diversity of birds, butterfly, Amphibia.

Common name: Spotted owl
Scientific name : Strix occidentalis

Common name: Brahminy kite
Scientific name : Haliastur indus

Common name:
Scientific name :

Common name: Common starling
Scientific name :Sturnus vulgaries

Common name: Kabae
Scientific name : common Myna

Common name: Pond heron
Scientific name : Ardeola

Common name: Woodpecker
Scientific name : Picidae

Common name: common kingfisher
Scientific name : Alcedo atthis

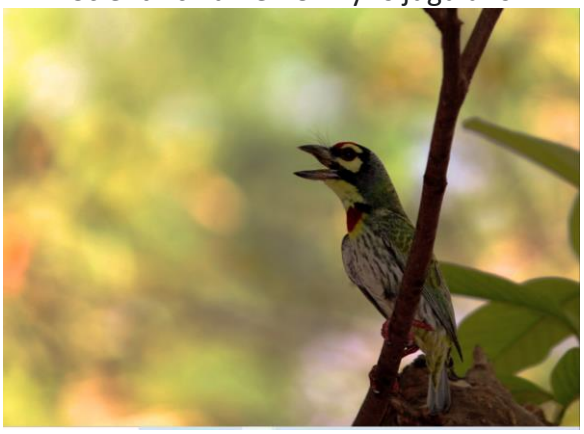
Common name: Purple sunbird
Scientific name : Cinnyris asiaticus

Common name: Common tailorbird
Scientific name : Orthotomus sutorius

Common name: Asian green bee-eater
Scientific name : Merops orientalis

Common name: olive-backed sunbird
Scientific name : Cinnyris jugularis

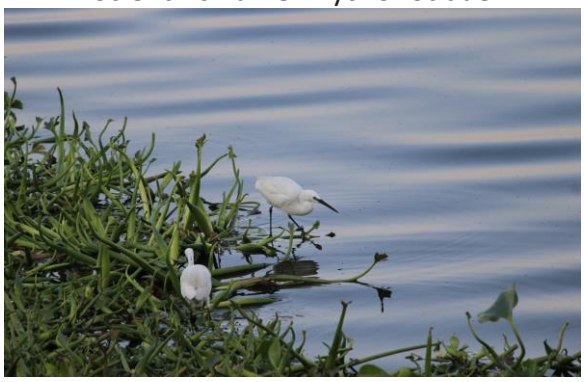
Common name: house sparrow
Scientific name : Passer domesticus



Common name: coppersmith barbet
Scientific name : Psilopogon haemacephalus

Common name: Bulbul
Scientific name : Pycnonotidae

Common name: laughing dove
Scientific name : Streptopelia senegalensis



Common name: Little egret
Scientific name : Egretta garzetta

Common name: Oriental darter
Scientific name : Anhinga melanogaster

Common name: Painted stork
Scientific name : Mycteria leucocephala

Common name:
Scientific name :

Common name: billed pelican
Scientific name : Pelecanus philippensis

Common name: Parrots
Scientific name : Psittaciformes

Common name: Robber flies
Scientific name : Asilidae

Common name: Dragonfly
Scientific name : Anisoptera

Common name:
Scientific name :

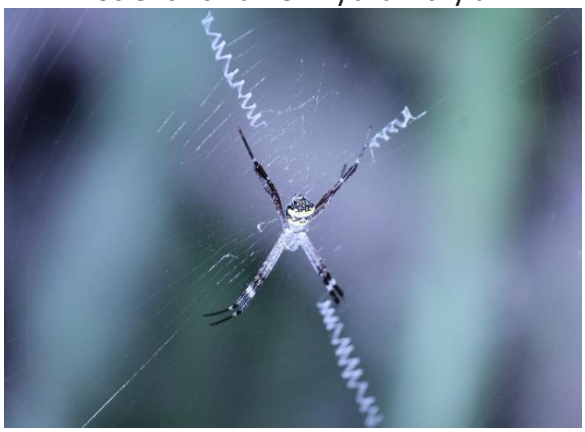
Common name:California sister
Scientific name :Adelpha bredowii

Common name:
Scientific name :

Common name: common tiger
Scientific name : Danaus genutia

Common name: Spotted Joker
Scientific name : Byblia ilithyia

Common name: Blue tiger
Scientific name : Tirumala limniace



Common name: Signature Spider
Scientific name : Argiope anasuja

Common name: button spider
Scientific name : Latrodectus umbukwane

ANNEXURE-III : LIST OF RAPTILES SPOTTED IN & AROUND MU

Scientific name: Rattus rattus
Common Name : House Rat

Scientific name: Calotes versicolor Common Name : Indian Garden Lizard

Scientific name: Hoplobatrachus tigerinus
Common Name : Indian Bull Frog

Scientific name: Naja naja
Common Name : Indian Cobra

Marwadi University
Marwadi Chandarana Group

GREEN AUDIT REPORT

2021-2022

Marwadi University

Rajkot-Morbi Road, Rajkot – 360003
Gujarat, India

Submitted By

Green Audit Team

TABLE OF CONTENTS

ACKNOWLEDGEMENT

Green Audit Assessment Team thanks to the Dean, Marwadi University, Rajkot for assigning the task of Green Audit of the university campus to us. We appreciate the cooperation that we got from all the faculties and students during the entire process. Our special thanks to Prof. (Dr.) Sandeep Sancheti, Provost and Shri Naresh Jadeja, Registrar of the university for their warm support and encouragement from the very beginning till the end of the process.

We are also thankful to the testing and consultancy cell for provided various test report done by them to match requirement of this audit & helping us in collecting different data and analyzing them.

We are also thankful to all the students, faculties and staff for provide help at different level to collect the various details as per the requirement of this green audit.

The entire team is very grateful to the management of Marwadi University for their continuous support and motivation to take various innovative and challenging assignments.

Dr. Tarak Vora
Team Leader
Green Audit Team
Marwadi University. Rajkot

DISCLAIMER

Green Audit Team Has prepare this report on the basis of primary data collected from the different areas of the university. All reasonable care has been takesn in its preparation: details contained in this reprort have been compiled in good faith based on information gathered.

Date: 25/03/2022

Prepared by:
Green Audit Team

1. BRIEF ABOUT MARWADI UNIVERSITY

In 2007-08 the availability of world class academic facilities in the Saurashtra region were sparse; which encouraged Marwadi Group, Rajkot to launch Marwadi Education Foundation's Group of Institutes, offering Technical and Professional UG & PG courses and programs such as B.E, MBA and MCA. Marwadi Education Foundation's Group of Institutions (MEFGI) was incepted as a major organ of Marwadi Education Foundation's Group of Institutions in 2008, under the Bombay Public Trust Act 1950. Marwadi Education Foundation's Group of Institutions is a body promoted by Marwadi Shares & Finance Limited; a major stock broking company in India & Chandarana Intermediaries Brokers Pvt. Ltd. Since its inception Marwadi Education Foundation's Group of Institutions were affiliated with Gujarat Technological University.

Commitment to provide best and industry relevant education received an overwhelming trust from the society and in order to blend Engineering with Science and support them through Management and Law disciplines and have multi disciplinary course offerings in Science, Commerce, Arts, Health and Management, Marwadi Education Foundation proposed to establish "Marwadi University" in the Year 2016. Marwadi University bill was introduced and passed in Gujarat Assembly and Marwadi University was established under Gujarat Private Universities act no. 9 of 2016 on 9th May, 2016.

2. VISION & MISSION OF MARWADI UNIVERSITY

2.1 VISION OF THE UNIVERSITY

To foster an environment that empowers people, organizations and societies through education, ideas, research and training.

2.2 MISSION OF THE UNIVERSITY

- To provide quality education and thereby bringing social transformation.
- To create leaders through innovation and entrepreneurship.
- To cultivate the culture of research advancements.
- To imbibe universal consciousness.
- To stimulate growth through industrial and international partner

3. GREEN AUDIT

Modernization and industrialization are the two important outputs of the twentieth century that have made human life more luxurious and comfortable. They are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources, and finally making our mother Earth ugly and inhospitable. The time has come to wake up, unite and combat together for a sustainable environment.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, universities, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly university.

3.1 GOALS OF GREEN AUDIT

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To conduct a survey to know the ground reality about green practices.
- To make sure that rules and regulations are taken care of to save environment.
- To avoid the interruptions in environment that are more difficult to handle and whose correction requires higher cost.
- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issues.
- To Identify strengths and weaknesses in green practices.

3.2 BENEFITS OF GREEN AUDIT

- It would help to protect the environment in and around the campus.
- Recognize the cost saving methods through waste minimization and management.
- Empower the organization to frame a better environmental performance.
- Point out the prevailing and fourth coming impacts on environment.
- Recognize the cost-saving methods through waste minimizing and managing.
- Ensures conformity with the applicable laws.
- Empower the organizations to frame a better environmental performance.
- Developing an environmental ethic and value systems in youngsters.
- It portrays a good image of an institution which helps building better relationships with the group of interested parties.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the University.
- It will help to build a positive impression through green initiatives for the upcoming NAAC visit.

4. ENVIRONMENTAL POLICY OF THE UNIVERSITY

Marwadi University, Rajkot always believes in maintaining its own standard in matter of environment and quality consciousness. It has taken number of initiatives to protect its own environment with a pollution free campus.

To create a green cover, Eco-friendly atmosphere, pure oxygen at the university campus, a plantation program is organized every year with active participation from the university community and visitors. Green Audit Team owns responsibility to preserve the work carried out on the campus related to the environment.

This also helps in ensuring that the Environmental Policy is enacted, enforced, and reviewed using various environmental awareness programs.

ENVIRONMENTAL POLICY

Both the teaching and Non-teaching staff of Marwadi University Rajkot are committed for carrying out its activity for sustainable development. This we will achieve through the following :-

i. To educate students and staff on how to appropriately utilize water effectively.
ii. To put the campus' "Rain Water Harvesting" to use.
iii. To make the most of the solar energy generated by the solar panels on the roofs of educational buildings.
iv. To use ICT as much as possible while using paper as little as possible. It will contribute to the "Paperless Office" initiative.
v. Using vermin-compost on the campus to turn solid waste into fertiliser.
vi. To lessen the campus' noise pollution.
vii. To protect and nurture the Flora and Fauna on the campus
viii. To maintain green campus.
ix. To use treated waste water for flushing and gardening purpose.
x. To use recycle the waste material and make them usable.

5. CONSTITUTION FOR GREEN AUDIT

The Green Audit is carried out as per the environmental policy of the Green audit checklist. The aim of the audit is to check the existing practices and provide advice for the development of environmental policy and practice in the areas of:

- ✓ Waste management
- ✓ Management water conservation and management
- ✓ Tree plantations
- ✓ Bio-diversity and threatened/ endangered species
- ✓ Preservations Energy use and conservations
- ✓ Eco-friendly campus
- ✓ Green environment and clean campus
- ✓ Spread environmental awareness
- ✓ Educate the people about sustainability

MEMBERS OF GREEN AUDIT TEAMS

Sr. No.	Name of Auditor	Designation
1	Dr. Tarak Vora	Team Leader
2	Dr. Abhishek Gupta	Member
3	Dr. Archana Sharma	Member
4	Dr. Nitinkumar Singh	Member
5	Dr. Hirendrasinh Padhiyar	Member
6	Mrs. Bhavna Thummar	Member
7	Mr. Raj Chapala	Member
8	Mr. Jyupil Joshi	Member
9	Mr. Devesh Poorey	Member
10	Mr. Ravi Modi	Member
11	Mr. Sachin Parmar	Member
12	Mr. Kalpesh Chandarana	Member

6. OBJECTIVES OF THE STUDY

The green audit's primary goal is to support environmental management and conservation on college campuses. According to the relevant laws, rules, and standards, the audit's goal is to identify, measure, explain, and prioritise the framework for environmental sustainability. The following are the primary goals of doing a green audit:

- ✓ To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use on the campus.
- ✓ To establish a baseline data to assess future sustainability by avoiding the interruptions inenvironment that are more difficult to handle and their corrections requires high cost.
- ✓ To bring out a status report on environmental compliance

7. METHODOLOGY

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered thefollowing areas to summarise the present status of environment management in the campus

- ➢ **Water management**
  - ✓ Raw Water
  - ✓ Drinking Water
  - ✓ Waste Water
  - ✓ Sewage Water
  - ✓ Rain Strom Drain Water
- ➢ **Energy Conservation**
  - ✓ Petrol
  - ✓ Diesel
  - ✓ LPG
  - ✓ Electricity

- **Waste management**
  - ✓ Domestic Waste Management
  - ✓ Grass Waste Management
  - ✓ Food Waste Management
  - ✓ Fiscal Waste Management

8. FOCUS AREA OF AUDIT

To match with the objective of the green audit, following areas are kept under the scope of the audit.

1. Water management
2. Air Pollution Management
3. Noise Pollution Management
4. Energy use & conservation
5. Waste Management
6. Green belt area & Bio-diversity
7. Environmental Awareness initiatives

8.1 WATER MANAGEMENT

Water is a valuable natural resource for all living organisms. It is freely available depending on the climate and topographic features of a region. Water is a precious natural national resource available with a fixed quantum. The availability of water is decreasing due to the increasing population of the nation; as per capita availability of utilized water is going down.

Even though it is naturally present, drinking water that is portable is not easily available for human consumption. Just 3% of the water on our planet, which covers 70% of its surface, is fresh water. The world's 1.1 billion inhabitants are experiencing a water crisis. Water issue is greatly impacted by water pollution and waste. An alarming amount of water is being contaminated. Water contamination can cause a variety of illnesses or even death. Because of this, it's crucial to make sure that drinking water is sterile, clean, and free of germs and illnesses. Also, it's crucial to manage, protect, and conserve water resources so that they may be used sustainably. The use and quality of water on the university campus are being studied by our institution. Water auditing is done to assess raw water intake facilities and identify facilities for water treatment and reuse. The concerned auditor looks at the appropriate approach that may be used to balance the supply and demand for water.

USES AND MANAGEMENT

SOURCE OF WATER

Sr. No.	Resource	Quantity
1	GWI (Narmada WATER)	-----
2	No of Open Well	02
3	No of Bore-well	03
4	Water reserve - Underground Tank	4 Lakh Liters

WATER USERS IN CAMPUS

Sr. No.	Person in different section	Strength (No. of person)
1	Staff	450
2	Hostel Boarders	1400
3	Residential Family Members	40
4	Visitors	2000
5	Construction Labour	125

The visitors of the college vary with respect to different activities conducted in the college campus. During admission and different competitive exam conducted in the college campus. The total number of visitors of the college increases up to 2000 on such day.

WATER CONSUMPTION IN DIFFERENT ACTIVITYIN COLLEGE CAMPUS

Activity	Water used per activity (in Litter)	No. of times Activity performed in a day	Average water used Person/Day	No. of people using water	Total water consumption per Day
Hand and face wash	4-6 L	4	16-24L	1550	31000
Drinking Water	0.2-0.4L	6	1.2-2.4L	1550	2790
Toilet Flush	8-10L	4	32-40L	1550	55800
Bath	30-40 L	1	30-40 L	1550	54250
Cooking & Washing In resident	150-250L	2	300-500L	40	16000
Cooking & Washing Hostel	10-15L	4	40-60L	1550	77500
Total					237340

WATER QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : DRINKING WATER

Test Report No / Ref.No. :- TA-537 **Date: 10-3-2022**

Name of Customer	Marwadi University, Rajkot
Address of Customer	Rajkot - Morbi Highway, Gauridad.
Environmental Condition	Ambient
Date of Sample Collection	5/3/2022
Nature of Sample	Colour: Colour less
Sample Quntitiy	100 ml
Packing Type	Plastic bottle
Type of Sampling	Grab
Sample Collected By	Mr. Kalpesh Parmar
Date of analysis starts	6/3/2022
Analysis conclude on	10/3/2022

Sr. No.	Parameters	Units	Test Method	Permissible Limit	Hostel-A	Hostel-B	Hostel-C	Hostel-D	Inter-national Canteen
1	**pH**	-	APHA 23rd Ed.,2017,4500-H+B	6.5 - 8.5	7.31	7.29	7.3	7.52	7.55
2	**TDS**	mg/L	APHA 23rd Ed. Method 2540-C	500	75.7	98.4	97.6	154	102
3	**Turbidity**	FNU	APHA 23rd Edition 2130-B(Page No.2-13)	1	0.67	0.47	0.51	0.67	0.37
4	**Conductivity**	µs/cm	APHA 23rd Ed. Titration Method 2510-B	200-800	201.5	201.2	206.4	308	204
5	**Chloride**	mg/L	APHA 23rd Ed 4500-Cl- B (Page No.4-75)	250	46	41	40	51	43
6	**Total Hardness**	mg/L	APHA 23rd Ed. Method 2510-B	200	72	52	76	140	48

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL = Minimum Detection Limit
2. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
3. This office is not responsible for the authenticity for the samples not collected by our officials.
4. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
5. Permissible Limits: as per Schedule VI of EPA Rules-1986
*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

End of Report

Dr. Nitin Kumar Singh
Testing Incharge

Dr. Tarak Vora
Quality Manager

STP TREATED WATER QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : STP WATER SAMPLES	
Test Report No / Ref.No. :- TA-537	**Date: 06-03-2022**
Name of Customer	Marwadi University
Address of Customer	Rajkot - Morbi Highway, Gauridad.
Date of Sample Collection	01-03-2022
Sample Collected By	Mr. Deepak bhai
Sample Tested By	Mr. Raj Chapala, Mr. Avon Dobariya & Mr. Jitesh Joshi
Date of analysis starts	02-03-2022
Analysis conclude on	06-03-2022

Sr. No.	Parameters	Units	Test Method	Acceptable Limit	Inlet	Treated Water (Before Filtration)	Treated Water (After Filtration)
1	pH	-	APHA 23rd Ed.,2017,4500-H+B	6.5-8.5	7.27	7.75	7.48
2	BOD	mg/L	APHA 23rd Ed. Method 2540-C	30	140	90	29
3	COD	mg/L	APHA 23rd Edition 2130B	100	198	101	57
4	TSS	mg/L	APHA 23RD Edition 2540 D	100	114.2	78.4	46.6
5	Turbidity	FNU	APHA 23rd Edition 2130-B	5	11.5	6.8	1.4
6	Oil and Grease	mg/L	APHA 23RD Edition 5520 G	10	14.2	12.6	6.2
7	Ammonical Nitrogen	mg/L	APHA 23RD Edition 4500-NH3 C	5	9.4	1.45	1.12

*NOTE

1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit, -- : Not Applicable

Testing Incharge

Team Leader

OBSERVATIONS IN REGARD OF WATER USAGES AND CONSERVATION PLAN

1. Treated water is used for flushing through dual plumbing system installed in all the buildings.
2. The garden is watered using sprinklers and drip irrigation system installed throughout the campus.
3. Drinking water quality is being tested regularly as per plan.
4. Law flow water fixtures are installed in bathroom and toilets.
5. Water level sensors are installed in the water tank for overflow cutoff.
6. Rainwater harvesting is done in the lake created in the campus.
7. Rainwater is being recharged in the bore.
8. Displays about the saving water are placed at various locations in the campus.

8.2 AIR POLLUTION MANAGEMENT

PERIODIC AWARENESS PROGRAMME FOR STAFF, STUDENTS AND SOCIETY

The university has consistently run programmes to raise staff, student, and societal awareness of the need to preserve and conserve the environment. Moreover, programmes and rallies on different environmental and health-related topics are organised in order to raise awareness. Students and professors at the university participate in NSS/NCC-related events.

A) MASS TRANSPORTATION FACILITY

As such campus is not generating any air pollution by its own activity except it has its own transportation department. Faculties and students of the university are motivated to use mass transportation system. Faculties are given some advantages for use of the bus facility provided by the university.

Regular maintenance of all the buses are planned and executed so that their milage as well as emission would remain efficient.

All the office bearer are motivated to use the university vehicles on sharing basis. It has been mandated unless and until its an emergency do not use university vehicles for single persons.

AIR QUALITY ASSESSMENT REPORT

ANALYSIS REPORT : AMBIENT AIR	
Name of Customer	Marwadi University
Address of Customer	Rajkot - Morbi Highway, Gauridad.
Environmental Condition	Satisfactory
Date of Sample Collection	20-03-2022
Nature of Sample	Colour : Colour Less
Sample Collected By	Jyupil Joshi
Sample Tested By	Raj Chapala
Date of analysis starts	21-03-2022
Analysis conclude on	27-03-2022

Sr. No.	Parameters	Units	Test Method	Permissible Limit	MAIN BUILDING
1	PM_{10}	($\mu g/m^3$)	IS 5182 (Part 23) (1999, Reaffirmed 2010)	100	48.25
2	$PM_{2.5}$	($\mu g/m^3$)	NAAQMS/36/2012-13	60	22.54
3	SO_2	($\mu g/m^3$)	IS 5182 (Part 2)	80	1.8
4	NO_x	($\mu g/m^3$)	IS 5182 (Part 6)	80	2.57

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.,BDL= Below Detection Limit, MDL = Minimum
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit, – : Not Applicable

Testing Incharge

Team Leader

STACK ASSESSMENT REPORT

ANALYSIS REPORT : STACK : DG SET					
Test Report No / Ref.No. :- TA-537					**Date:- 15-09-2021**
Name of Customer	Marwadi University, Rajkot				
Address of Customer	Rajkot - Morbi Highway, Gauridad.				
Temperature	31°C				
Weather Condition	Satisfactory				
Date of Sample Collection	14-09-2021				
Nature of Sample	Colour : Colour Less				
Sample Collected By	Dr. Tarak Vora, Mr. Jitesh Joshi & Mr. Jyupil Joshi				
Date of analysis starts	14-09-2021				
Analysis conclude on	15-09-2021				
Sr. No.	**Parameters**	**Units**	**Test Method**	**Permissible Limit**	**DG Set**
				Stack Height In Meter	**10**
1	**PM**	mg/Nm^3	IS 11255 (Part 1)	150	37.84
2	**SO_2**	ppm	IS 11255 (Part 2)	100	17.21
3	**NO_x**	ppm	IS 11255 (Part 7)	50	26.76

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit

End of Report

Dr. Nitin Kumar Singh
Testing Incharge

Dr. Tarak Vora
Quality Manager

8.3 NOISE POLLUTION MANAGEMENT

A) SILENCE ZONES IN THE UNIVERSITY

For awareness of the need to preserve silence at the institution, several display boards have been put up in the library and other locations.

B) NOISE CONTROL IN THE UNIVERSITY

The institution has enacted a no honking policy that forbids the use of any noise on campus, including honking.

On college campuses, noise pollution is maintained to a minimum and designated quiet zones are established in places like the library and classrooms.

C) DG SET FOR POWER BACK-UP

Every time there is a power outage because of load shedding or maintenance on the college campus, the college uses its DG backup system. Noise monitoring of the stack of DG set is being done on regular basis.

D) AWARENESS ABOUT NOISE POLLUTION

University is conducting awareness drives about the harms due to noise pollution for the students and faculties of the campus.

NOISE LEVEL ASSESSMENT REPORT

ANALYSIS REPORT : NOISE			
Name of Customer		Marwadi University	
Address of Customer		Rajkot - Morbi Highway, Gauridad.	
Environmental Condition		Satisfactory	
Date of Sample Collection		02-01-2022	
Sr. No.	**Location**	**Permissible limit**	**Day (dB-A)**
1	**Main Gate**	65	60
2	**PG Building**		53
3	**Hostel Aera**		52
4	**Main Canteen**		58
5	**New Canteen**		54

*NOTE
1. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
2. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
3. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Laboratory in writing.
4. This office is not responsible for the authenticity for the samples not collected by our officials.
5. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
6. Permissible Limits: as per Schedule VI of EPA Rules-1986

*ND : Not Detected, BDL : Below Detection Limit

Testing Incharge

Team Leader

8.4 ENERGY USE AND CONSERVATION

Energy use, energy sources, energy monitoring, lights, appliances, natural gas, and cars are all included by this indication. Energy usage is obviously a crucial component of campus sustainability, therefore its inclusion in the assessment needs no justification.

Following Energy Sources are used in the college

- ✓ Electrical
- ✓ Diesel
- ✓ Petrol
- ✓ LPG

OBSERVATIONS

- University has installed electrical meters at various locations to understand the power usage pattern.
- University is doing energy audit on yearly basis as per the planned schedule.
- University has installed 650 kVA rooftop solar panel within the campus. This meets almost 50% of its total demand.
- Sensor based lights are installed in the main building.
- University it converting all the lights to the LED lights phase wise as per the plan.

8.5 WASTE MANAGEMENT

Waste management is the managing of waste by disposal and recycling of it. Moreover, waste management needs proper techniques keeping in mind the environmental situations. For instance, there are various methods and techniques by which the waste is disposed of. Some of them are Landfills, Recycling, Composting, etc. Furthermore, these methods are much useful in disposing of the waste without causing any harm to the environment. Waste management is a very crucial aspect of any of the organization. Marwadi university campus is spreaded over 42 acres of land where it is dealing with different types of waste as listed below.

- ✓ Domestic waste
- ✓ Food waste
- ✓ Green waste

OBSERVATIONS

SEGREGATION OF DOMESTIC WASTE

Colour coded dustbins are installed. Three separate dustbins, near each block for disposal of different types of wastes. All the segregated wastes are dumped in the particular dustbins of green, blue, yellow colour.

- ✓ The wet and biodegradable wastes are dumped in green dustbin. For e.g.: kitchen wastes including vegetables and fruits skins.
- ✓ Disposal of plastic wrappers and non-biodegradable wastes are meant for blue coloured dustbin.
- ✓ Papers and glass bottles are disposed in yellow dustbins
- ✓ Cleaning or emptying of the dustbins is being done on a regular basis at an allocated time.

200 kLD STP PLANT

Recycling of water is the crucial thing when water consumption is high in the organization. University has setup a 200 kLD Sewage Treatment Plant in the campus. Treated water is being used for gardening purpose. Excess treated water is used in the flushing as all the buildings are installed with dual plumbing system to utilized treated water in flushing.

RECYCLING OF WASTE

Vermicomposting is a method of making compost, with the use of earthworms, which generally live-in soil, eat biomass and excrete it in digested form. This compost is generally called vermicompost or Wormicompost. Marwadi University has prepared the composting beds for converting grass waste into the compost. Compost produced through the beds are distributed to the students and faculties of the campus.

INSTALLATION OF BIOGAS PLANT

University has installed 45 CUM capacity biogas plant within the campus. Where the combination of cow dung, food waste and grass waste is used as raw material. Biogas produced from the plant is utilized for cooking in the hostel canteen.

8.6 GREEN BELT AREA & BIO-DIVERSITY

The Green Belt Area is intended to preserve the environment and enhance the visual value of the college grounds. To guarantee that the structures adhere to green standards, the college's green area consists of the campus's vegetation, greenery, and sustainability. Also, by implementing various environmental awareness programmes, this aids in ensuring that the Environmental Policy is adopted, implemented, and evaluated.

OBSERVATIONS

The campus is close to over 65 different types (species) of flora and animals. Via the NSS unit, several tree planting initiatives are held during the months of July and August on college campuses and in the nearby communities. This initiative aids in promoting an eco-friendly atmosphere that gives the institute pure oxygen and raises awareness among the communities. The planting initiative comprises a variety of native decorative and therapeutic plants. The occurrence of similar species planted, such as "NEEM," is noted rather than sustaining biodiversity. Neem, Indian Blackberry Tree, Flame Tree, Mango Tree, Jack Fruit Tree, Teak, and Spanish Cherry Plant are the predominant species in the green belt. University have done tree plantation drive within the campus. Students and faculties have participated in the tree plantation drive and taken the pledge to plant the trees and will motivate others to do so. It is also planned to plant the trees outside the campus also in a systematic planned manner.

8.7 ENVIORNMENTAL AWARENESS INITIATIVES

Marwadi University regularly educates employees and faculty on how to use bicycles, how to use paper responsibly, and how to establish a plantation aim. Some of the steps done include the display of environmental protection banners, signs encouraging people to save electricity and water in prominent locations, and garbage disposal containers for both wet and dry waste. All the days like Environment day, world water day, etc. all celebrated by conducting seminars, expert lectures and competitions to spread the awareness about environmental conservation by the university. University has set the target to get Green Building Certification for the university campus. Thus, Marwadi University would become first university in the state to get such Green Building Certificate. Recently, the campus has received the Best Green Campus Award for the Rajkot city.

9. EXECUTIVE SUMMERY & RECOMMENDATIONS

The university has created a green environmental policy and is working to promote sustainable growth on the campus. The university has created a team of academics and students that works to preserve biodiversity on the campus and contributes to efforts to reduce pollution in society. The university intends to add environmental management and protection to its curriculum. The university has given faculty and students workshops and trainings on environmental awareness. Law flow water fixtures are installed in the campus. Campus have planned for waste management and taken initiatives towards recycling of waste. Green audit has also covered energy parameters also in the observation this time; however, detailed energy audit is being conducted by electrical department on yearly basis.

It is also verified that the initiatives on almost all the recommendations of the previous year have been taken by the university which are found satisfactory.

GOOD POINTS OBSERVED

- ✓ Marwadi university has received District Green Champion Award for the year 2021-21 on 19/08/2021 from Department of Higher Education, Ministry of Education, Government of India.
- ✓ Marwadi University is working on its own ERP in which more than 80% of its work is transformed into the paperless working approach.
- ✓ Marwadi University promotes waste utilizing by consuming building materials building materials having concrete with fly ash, flay ash bricks, AAC Blocks containing fly ash, Portland Pozzolana Cement, etc.
- ✓ Marwadi University has the policy to use local materials as far as possible in various construction in the campus. Almost all the materials are sourced withing 10-100 km radius only.
- ✓ Marwadi University have motivated and facilited two of its faculties to become Green Building Certified Professionals.

RECOMMENDATIONS

1. University should get Green Building Certificate to get the recognition for the various initiatives taken by the university towards sustainability.
2. Plan and execute tree plantation drive outside the campus also.
3. Security should inspect PUC certificates for all vehicles accessing the site.
4. More water meters should be installed to have mapping of the water usage pattern.
5. More avenues shall be explored to have the paperless approach in the internal working mechanism of the university in addition to all existing in practice.

ANNEXURE I : LIST OF TREES & PLANTS SPOTTED IN & AROUND MU

A survey was carried out to find plant diversity in the campus of Marwadi University. The survey was focused on the diversity of plants and trees on the basis of their classification and economic importance.

Species Type	Tree	
Botanical Name	*Bauhinia purpurea*	
Common Name	Butterfly Tree, geranium Tree	
Family	Fabaceae Caesalpinioideae	
Local Names	• Gujarati: Hadayparni	
	• Sanskrit : Kanchanar (red)	

Species Type	Tree	
Botanical Name	Azadirachta indica	
Synonyms	*Antelaea indica* (L.) Adelb., *Melia azadirachta* L., *Melia indica* (A. Juss.) Brandis	
Common Name	Neem	
Family	Meliaceae	
Local Names	• Hindi :	Neem
	• Gujarati :	Limbado , Kadavo Limbado
	• Sanskrit :	Nimba

Species Type	Tree	
Botanical Name	Khaya senegalensis	
Common Name	Senegal Mahogany, African Mahogany, Senegal Khaya	
Family	Meliaceae	
Local Name	• Gujarati: Khaya	

Species Type	Tree	
Botanical Name	Spathodea campanulata	
Common Name	*African tulip tree*	
Family	Bignoniaceae	
Local Names	• Gujarati: Tulip tree	

Species Type	Tree	
Botanical Name	Samanea saman	
Common Name	Saman,Pukul Lima, Cow Tamarind, Hujan-Hujan, East Indian Walnut, Monkey, rain tree	
Family	Fabaceae (alt. Mimosaceae), legume family	
Local Names	• Gujarati: *Shirish,*	
	• Sanskrit :*Shiriisha*	

Species Type	Tree	
Botanical Name	*Terminalia mantaly*	
Common Name	Madagascar Almond, Umbrella Tree	
Family	Combretaceae	
Local Names	• Gujarati: African tree	

Species Type	Tree	
Botanical Name	Alstonia scholaris	
Common Name	Scholar Tree, Dita bark, Devil tree, Blackboard Tree	
Family	Apocynaceae	
Local Names	• Gujarati: *Saptaparni*	
	• Sanskrit :Saptaparna	
Uses	Medicinal uses: ⚠Its bark, known as Dita Bark, is used in traditional medicine to treat dysentery and fever. In Ayurveda it is used as a bitter and as an astringent herb for treating skin disorders, malarial fever, urticaria, chronic dysentery, diarrhea, in snake bite and for upper purification process of Panchakarma . The Milky juice of the tree is applied to ulcers.	

Species Type	Tree	
Botanical Name	Lagerstroemia speciosa	
Common Name	Giant crepe-myrtle, Queen's crepe-myrtle, banabá plant, or pride of India	
Family	Bignoniaceae	
Local Names	• Gujarati: Jarul, Moto Bhondar	
	• Sanskrit : Syandana	

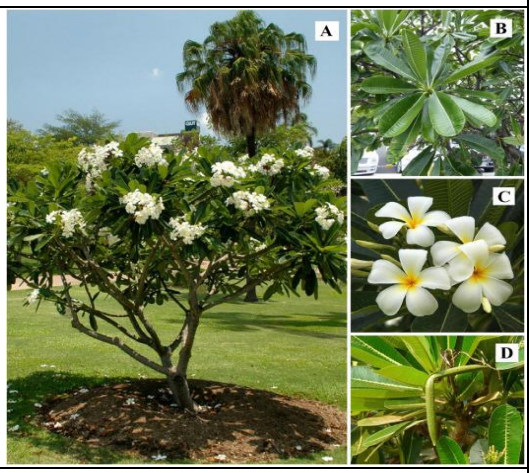
Species Type	Tree	
Botanical Name	Senna siamea	
Common Name	kassod tree, cassod tree and cassia tree	
Family	Fabaceae	
Local Names	• Gujarati: kashid tree	

Species Type	Tree	
Botanical Name	Delonix regia	
Common Name	*Flame Tree, Royal Poinciana*	
Family	Fabaceae	
Local Names	• Gujarati: Gulmohar	
	• Sanskrit : Raj abharan tree, Krishna chud tree	

Species Type	Tree	
Botanical Name	Tabebuia rosea	
Common Name	Salvador Pink Trumpet Tree	
Family	Bignoniaceae	
Local Names	• Gujarati: Vasant Rani	

Species Type	Tree	
Botanical Name	*Cassia fistula*	
Common Name	Golden shower tree, Amaltas	
Family	Fabaceae	
Local Names	• Gujrati: Garmalo	
	• Sanskrit : Aragwadha	
Uses	specially used in joint pain, migraine, chest pain and blood dysentery. Amaltas root is also useful in fever, heart diseases, retained excretions and biliousness. It is also used in cardiac disorders biliousness, rheumatic condition, haemorrhages, wounds, ulcers and boils and various skin diseases.	

Species Type	Small Tree	
Botanical Name	Melaleuca citrina	
Common Name	Bottlebrush, crimson bottlebrush, or lemon bottlebrush tree	
Family	Myrtaceae	
Local Names	• Gujarati: Cheel	

Species Type	Small Tree (flower)	
Botanical Name	Plumeria Alba	
Common Name	Champa, Gulchin	
Family	Apocynaceae	
Local Names	• Gujarati: Champa	

.

Species Type	Tree	
Botanical Name	Mimusops elengi	
Common Name	Borsalli, Bakul, Spanish Cherry	
Family	Sapotaceae	
Local Names	• Gujarati: Borsali	
	• Sanskrit :Bakul	
Uses	The bark, flowers, fruits, and seeds of *Bakula* are used in Ayurvedic medicine in which it is purported to be astringent, cooling, anthelmintic, tonic, and febrifuge. It is mainly used for dental ailments such as bleeding gums, pyorrhea, dental caries, and loose teeth	

Species Type	Tree (Fruit)	
Botanical Name	Achras sapota/Manilkara zapota	
Common Name	Chiku, Sapodilla, Sauh Menila, Naseberry, Nispero, Chicle, Chicle Gum, Ciku	
Family	Sapotaceae.	
Local Names	• Gujarati: Chiku	
	• Sanskrit : Vikootam	

Species Type	Shrub (flower)	
Botanical Name	(Rosa rubiginosa ,Rosa indica, *Rosa grandiflora*; Rosa bonica; Rosa floribunda; Rosa gallicanae; Rosa pimpinellifoliae)	
Common Name	Rose, Gulab, rosa	
Family	Rosaceae	
Local Names	• Gujarati: Gulab	

Species Type	Palm	
Botanical Name	Hyophorbe lagenicaulis	
Common Name	Royal palm	
Family	Arecaceae	
Local Names	• Gujarati: *bottle palm*	

Species Type	Palm	
Botanical Name	*Caryota mitis*	
Common Name	fishtail palm, kitul palm, toddy palm, wine palm, sago palm and jaggery palm.	
Family	Arecaceae	
Local Names	• Gujarati: fishtail palm	

Species Type	Shrub(Medicinal)	
Botanical Name	*Adhatoda vasaka*	
Synonyms	*Adhatoda beddomei*	
Common Name	Vasaca small	
Family	Acanthaceae	
Local Names	• Gjarati :Ardusi	

Species Type	Shrub	
Botanical Name	*Ocimum gratissimum*	
Synonyms	*Ocimum gratissimum L*.	
Common Name	Shrubby basil, Rama tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Jangli tulasi	

Species Type	Shrub	
Botanical Name	*Hibiscus rosa-sinensis*	
Common Name	Jasud, Shoe flower and china rose	
Family	Malvaceae	
Local Names	• Gujarati Name-: Jasud	

Species Type	Shrub	
Botanical Name	*Lawsonia inermis*	
Synonyms	*Lawsonia alba* lam., *Lawsonia spinosa* L.	
Common Name	Mehandi	
Family	Lythraceae	
Local Names	• Marathi : Mehendi	
	• Gujarati : Mehndi	

Species Type	Shrub	
Botanical Name	*Datura metel*	
Synonyms	*Datura fastuosa* L., *Datura fastuosa* var. *alba* (Nees) C.B. Clarke	
Common Name	Dhattura	
Family	Solanaceae	
Local Names	• Marathi : Dhotra - Black	
	• Gujarati : Dhaturo	

Species Type	Shrub	
Botanical Name	*Rauvolfia tetraphylla*	
Synonyms	*Rauvolfia canescens* L., *Rouvolfia tomentosa* Jacq., *Rauvolfia tetraphylla* L.	
Common Name	Bara Chand	
Family	Apocynaceae	
Local Names	• Gujarati : Sarpagandha	

Species Type	Shrub	
Botanical Name	*Mimosa pudica*	
Synonyms	Touch me not	
Common Name	Ail	
Family	Fabaceae - Mimosoideae	
Local Names	Gujarati : lajawni	

Species Type	Tree	
Botanical Name	*Bauhinia variegata*	
Synonyms	*Bauhinia candida* Roxb.	
Common Name	*Mountain ebony*, Kachnar	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kanchnar	
	• Sanskrit Kanchanar (white)	

Species Type	Tree	
BotanicalName	*Bixa orellana*	
Synonyms	*Bixa orellana* L.	
CommonName	Sindhuri	
Family	Bixaceae	
Local Names	• Marathi : Shenduri	

Species Type	Tree	
Botanical Name	Butea monosperma	
Synonyms	*Butea frondosa* Koening ex Roxb., *Erythrina monosperma* Lam., *Butea monosperma* L.	
Common Name	Palas	
Family	Fabaceae-Papilionioideae	
Local Names	• Marathi : Palas, khakra	
	• Gujarati : Khaakhro	
	• Hindi : Palash	

Species Type	Tree	
Botanical Name	*Eucalytus globulus*	
Synonyms	*Eucalyptus gigantea* Dehn., *Eucalyptus glauca* DC., *Eucalyptus perfoliata* Desf., *Eucalyptus pulverulenta* Link	
Common Name	Australian gum Tree, Eucalyptus	
Family	Myrtaceae	
Local Names	• Marathi : Nilgiri	
	• Gujarati : Nilgiri	

Species Type	Tree	
Botanical Name	*Nyctanthes arbo-tristis*	
Synonyms	*Bruschia macrocarpa* Bertol., *Nyctanthes arbor-tristis* var. dentata Hort.ex Moldenke, *Nyctanthes dentata* Blume, *Nyctanthes tristis* Salisb., Parilium arbor-tristis Gaertn., *Scabrita triflora* L.	
Common Name	Night jasmine, Harshingar	
Family	Nyctanthaceae	
Local Names	• Sanskrit : Parijata	
	• Gujarati : Paarijaat	

Species Type	Tree	
Botanical Name	*Peltophorum pterocarpum*	
Synonyms	*Caesalpinia gleniei* Thwaites, *Caesalpinia inermis* Roxb., Inga pterocarpa DC., *Peltophorum ferrugineum* (Decne) Benth., *Peltophorum inerme* (Roxb.) Llanos, *Peltophorum roxburghii* (G.Don) Degener, *Poiciana roxburghii* G.Don	
Common Name	Yellow gold mohur	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Taamraparni	

Species Type	Tree
Botanical Name	*Cocos nucifera* 
Common Name	Coconut palm
Family	Arecaceae
Local Names	• Marathi : Naral
	• Gujarati :Nariyeli

Species Type	Tree	
Botanical Name	*Ficus religiosa*	
Synonyms	Urostigma religiosum (L.) Gasparrini	
Common Name	Bot-Tree, Pipal	
Family	Moraceae	
Local Names	• Marathi : Pimpal	

Species Type	Tree	
Botanical Name	*Mangifera indica* L.	
Synonyms	*Mangifera indica* L.	
Common Name	Aam	
Family	Ancardiaceae	
Local Names	• Marathi : Amba	

Species Type	Tree	
Botanical Name	*Murraya Koenigii*	
Synonyms	*Bergera koenigii* L., *Chalcas koenigii* (L.) Kurz, *Murraya foetidissima* Teijsm. & Binnend, *Murraya koenigii* (L.) Spreng	
Common Name	Indian curry leaf Tree, Mitha neem	
Family	Rutaceae	
Local Names	• Marathi : kadhi patta	
	• Gujarati: Mitho Limdo	

Species Type	Tree	
Botanical Name	*Saraca indica*	
Common Name	Asoka	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : ashok	
	• Gujarati : Ashok	

Species Type	Tree	
Botanical Name	*Tamarindus indica*	
Synonyms	*Tamarindus occidentalis* Gaertn., *Tamarindus officinalis* Hook.	
Common Name	Tamarind Tree, Imli	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Chinch	
	• Gujarati : Khaati Amli	

Species Type	Herb	
Botanical Name	*Aloe barbadensis*	
Synonyms	*Aloe abyssinica* Lam., *Aloe chinensis* Baker, *Aloe indica* Royle, *Aloe littoralis* Koenig ex Baker, *Aloe vera* (L.) Burm.f., *Aloe vulgaris* Lam., *Alpinia allhugas* Roscoe, *Aloe barbadensis* Mill.	
Common Name	Aloe	
Family	Liliaceae	
Local Names	• Marathi :Korphad	
	• Gujarati : Ghrutakumari	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	*Senna occidentalis* (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Gujarati : Kaasundro	

Species Type	Herb	
Botanical Name	*Catharanthus roseus*	
Synonyms	*Lochnera rosea* (L.) Reichb., *Vinca rosea* L.*, Catharanthus roseus* (L.) G. Don	
Common Name	Sadabahar	
Family	Apocynaceae	
Local Names	• Marathi : Sadaphuli	

Species Type	Herb	
Botanical Name	*Cymbopogon citratus*	
Synonyms	*Andropogon citratus* DC., *Cymbopogon citratus* (DC.) Stapf	
Common Name	Lemon grass, Gandh-ghas	
Family	Poaceae	
Local Names	• Gujarati : Lili-cha	

Species Type	Herb	
Botanical Name	*Elettaria cardamomum*	
Common Name	Elaichi	
Family	Scitaminaceae	
Local Names	• Marathi : elaichi	

Species Type	Herb	
Botanical Name	*Mentha piperita*	
Common Name	Peppermint	
Family	Lamiaceae	
Local Names	• Marathi : Pudina	
	• Gujarati : Pudino	

Species Type	Herb	
Botanical Name	*Mimosa pudica*	
Synonyms	*Mimosa pudica L*.	
Common Name	Touch-me-not	
Family	Fabaceae-Mimosoideae	
Local Names	• Marathi : Lajwanti	
	• Gujarati : Lajaamni	

Species Type	Herb	
Botanical Name	*Ocimum basilicum*	
Common Name	Babui tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Sabja, tulas	
	• Gujarati : Damro	

Species Type	Herb	
Botanical Name	*Ocimum sanctum*	
Synonyms	*Ocimum inodurum* Burm.	
Common Name	Tulsi	
Family	Lamiaceae	
Local Names	• Marathi : Krishna Tulas	
	• Gujarati : Vishnu Tulsi	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : isabgula	

Species Type	Herb	
Botanical Name	*Rauvolfia serpentina*	
Synonyms	*Ophioxylon album* Gaertn., *Ophioxylon serpentium* L., *Ophioxylon trifoliatum* Gaertn., *Rauvolfia trifoliata* (Gaertn.) Baill., *Rauvolfia serpentina* (L.) Benth. ex Kurz	
Common Name	Sarpagandha, chota chand	
Family	Apocynaceae	
Local Names	• Marathi : Sarpagandha	
	• Sanskrit: Sarpagandha	

Species Type	Herb	
BotanicalName	*Solanum surattense*	
Synonyms	*Solanum mccanni* Sant., *Solanum xanthocarpum* Schrad. & Wendl.	
CommonName	Kantakari, Kateli	
Family	Solanaceae	
Local Names	• Gujarati : Kantkari	

Species Type	Herb	
Botanical Name	*Swertia chirata*	
Common Name	Kiryata	
Family	Gentianaceae	
Local Names	• Gujarati : chirata	

Species Type	Herbs	
Botanical Name	*Zingiber officeinale*	
Common Name	Adrak	
Family	Zingiberaceae	
Local Names	• Marathi : Adrak	
	• Gujarati : adu	

Species Type	*Shrub*	
Botanical Name	*Withania somnifera*	
Synonyms	*Physalis flexuosa* L., *Physalis somnifera* L., *Withania somnifera* (L.) Dunal.	
Common Name	Ashwagandha	
Family	Solanaceae	
Local Names	• Marathi : Ashwagandha	
	• Gujarati : Ashwagandha	

Species Type	*Herb*	
Botanical Name	Kalanchoe pinnata	
Synonyms	• Bryophyllum pinnatum (Lam.) Oken. • Bryophyllum calycinum Salisb. • Cotyledon pinnata Lam.	
Family	Crassulaceae	
Local Names	• Gujarati : patthar-chatti	
	• Sanskrit :	

Species Type	Climber	
Botanical Name	*Asparagus racemosus*	
Synonyms	*Asparagus racemosus* Willd	
Common Name	Satavari	
Family	Liliaceae	
Local Names	• Marathi : Shatavari	
	• Gujarati : Shatavari	

Species Type	Shrub	
Botanical Name	*Adhatoda vasica*	
Synonyms	*Adhatoda vasica* Nees	
Common Name	Malabar nut	
Family	Acanthaceae	
Local Names	• Marathi :	
	• Gujarati :	

Species Type	Tree	
Botanical Name	*Pongamia pinnata*	
Common Name	Indian beach	
Family	Fabaceae-Papilionioideae	
Local Names	• Marathi : Karanj	
	• Gujarati : Karanj	

Species Type	Climber	
Botanical Name	*Tylophora indica*	
Synonyms	*Asclepias asthmatica* L. f., *Cynanchum bracteatum* Thunb., *C. indicum* Burm. f., Hoya hirsuta Moon. *Tylophora asthmatica* (L.f.) Wight & Arn.	
Common Name	Indian ipecacuanha	
Family	Asclepiadaceae	
Local Names	• Marathi : Damvel	
	• Gujarati : Damvel	

Species Type	Climber	
Botanical Name	*Piper longum*	
Synonyms	*Chavica roxburghii* Miq., *Piper longum* L.	
Common Name	Indian long pepper, Pipal	
Family	Piperaceae	
Local Names	• Marathi : Lendi pimpli	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Bacopa monnieri*	
Synonyms	*Bacopa monnieria* (L.) Wettst., *Gratiola monnieria* L., *Herpestis monniera* Benth., *Herpestis monnieria* (L.) HBK., *Lysimachia monnieri* L., *Moniera cuneifolia* Michx.	
Common Name	Thyme-leaved Gratiola , Jal Brahmi	
Family	Scrophulariaceae	
Local Names	• sanskruit : Brahmi	
	• Gujarati :	

Species Type	Herb	
Botanical Name	*Eclipta alba*	
Common Name	Bhangra	
Family	Asteraceae	
Local Names	• sanskruit : Bhrungaraj	
	• Gujarati : Bhaangro	
	• Hindi : Bhringraj	
	• Marathi : Maka (White)	

Species Type	Herb	
Botanical Name	*Plantago ovata*	
Common Name	Isabgol	
Family	Plantaginaceae	
Local Names	• Marathi : Isabgol	
	• Gujarati : Isabgol	

Species Type	Climber
Botanical Name	*Mucuna pruriens* 
Synonyms	*Carpopogon niveum* Roxb., *Carpopogon pruriens* Roxb., *Dolichos pruriens* L., *Mucuna nivea* (Roxb.) DC., *Mucuna prurita* Hook., *Stizolobium pruriens* (L.) Medikus
Common Name	Kawach
Family	Fabaceae
Local Names	• Marathi : Khaj-kujli - Black
	• Gujarati : Kaucha

Species Type	Herb
Botanical Name	*Trachyspermum ammi* 
Common Name	Carum Ajwain
Family	Apiaceae
Local Names	• Marathi : Owaa
	• Gujarati : Kaucha

Species Type	Tree	
BotanicalName	*Punica granatum*	
Synonyms	*Punica granatum* L.	
CommonName	Anar	
Family	Lythraceae	
Local Names	• Marathi : Dalimb	
	• Gujarati : Daadam	

Species Type	Herb	
Botanical Name	*Cassia occidentalis*	
Synonyms	Senna occidentalis (L.) Link	
Common Name	The Negro coffe, Kasondi	
Family	Fabaceae-Caesalpinioideae	
Local Names	• Marathi : Kaasundro	
	• Gujarati : Kaasundro	

ANNEXURE-II : LIST OF BIRDS SPOTTED IN & AROUND MU

A survey was carried out to find the animal diversity in the campus of Marwadi University Rajkot. The survey focused on the diversity of birds, butterfly, Amphibia.

Common name: Spotted owl
Scientific name : Strix occidentalis

Common name: Brahminy kite
Scientific name : Haliastur indus

Common name:
Scientific name :

Common name: Common starling
Scientific name :Sturnus vulgaries

Common name: Kabae
Scientific name : common Myna

Common name: Pond heron
Scientific name : Ardeola

Common name: Woodpecker
Scientific name : Picidae

Common name: common kingfisher
Scientific name : Alcedo atthis

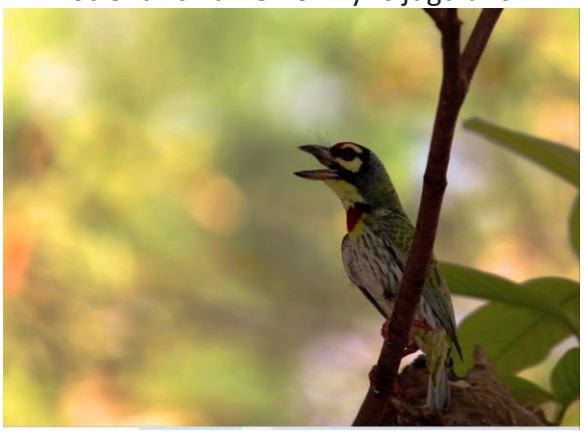
Common name: Purple sunbird
Scientific name : Cinnyris asiaticus

Common name: Common tailorbird
Scientific name : Orthotomus sutorius

Common name: Asian green bee-eater
Scientific name : Merops orientalis

Common name: olive-backed sunbird
Scientific name : Cinnyris jugularis

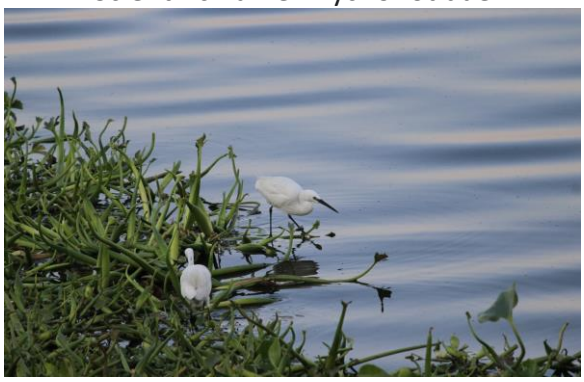
Common name: house sparrow
Scientific name : Passer domesticus



Common name: coppersmith barbet
Scientific name : Psilopogon haemacephalus

Common name: Bulbul
Scientific name : Pycnonotidae

Common name: laughing dove
Scientific name : Streptopelia senegalensis



Common name: Little egret
Scientific name : Egretta garzetta

Common name: Oriental darter
Scientific name : Anhinga melanogaster

Common name: Painted stork
Scientific name : Mycteria leucocephala

Common name:
Scientific name :

Common name: billed pelican
Scientific name : Pelecanus philippensis

Common name: Parrots
Scientific name : Psittaciformes

Common name: Robber flies
Scientific name : Asilidae

Common name: Dragonfly
Scientific name : Anisoptera

Common name:
Scientific name :

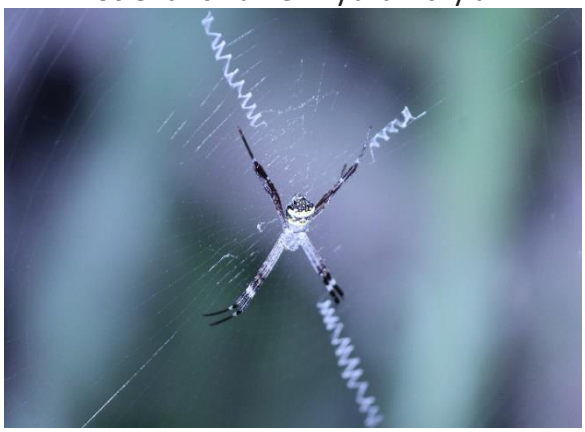
Common name:California sister
Scientific name :Adelpha bredowii

Common name:
Scientific name :

Common name: common tiger
Scientific name : Danaus genutia

Common name: Spotted Joker
Scientific name : Byblia ilithyia

Common name: Blue tiger
Scientific name : Tirumala limniace



Common name: Signature Spider
Scientific name : Argiope anasuja

Common name: button spider
Scientific name : Latrodectus umbukwane

ANNEXURE-III : LIST OF RAPTILES SPOTTED IN & AROUND MU

Scientific name: Rattus rattus
Common Name : House Rat

Scientific name: Calotes versicolor Common Name : Indian Garden Lizard

Scientific name: Hoplobatrachus tigerinus
Common Name : Indian Bull Frog

Scientific name: Naja naja
Common Name : Indian Cobra