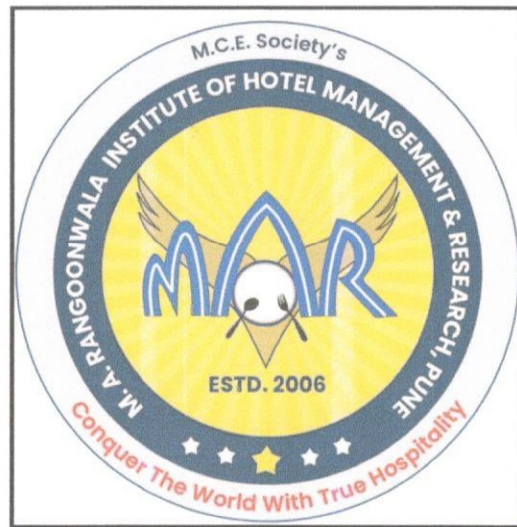


GREEN AUDIT REPORT

of

Maharashtra Cosmopolitan Education Society's,
**M. A. RANGOONWALA INSTITUTE OF HOTEL
MANAGEMENT & RESEARCH PUNE**

Azam Campus, K B Hidaytullah Road, Camp, Pune 411 001



Year: 2022-23

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: engress123@gmail.com



ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School,
Parvati, Pune 411 009 Tel: 09890444795 Email: engress123@gmail.com
MEDA Registration No: ECN/2022-23/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

GREEN AUDIT CERTIFICATE

Certificate No: ES/MARIHM/22-23/02

Date: 14/7/2023

This is to certify that we have conducted an Green Audit at Maharashtra Cosmopolitan Education Society's M. A. Rangoonwala Institute of Hotel Management & Research Pune, Camp, Pune 411 001, in the Year 2022-23.

The Institute has adopted following Green & Sustainable Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 50 kWp Roof Top Solar PV Plant
- Segregation of Waste at source
- Vermi Composting Pit for conversion of organic Waste
- Installation of Bio Gas Plant, for conversion of Leftover Food Waste
- Implementation of Rain Water Harvesting Project
- Good Internal Road
- Internal Tree Plantation
- Provision of Ramp for Divyangajan
- Creation of awareness on Plastic Free Campus by Display of Posters
- Tree Plantation Event in the Campus

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Engress Services,




A Y Mehendale,

B E- Mech, M Tech-Energy, Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788



REGISTRATION CERTIFICATES



MAHARASHTRA ENERGY DEVELOPMENT AGENCY
Maharashtra Energy Development Agency
 (Government of Maharashtra Certification)
 Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
 Aundh, Pune, Maharashtra 411007
 Ph No: 020-26004351
 Email: geemaharaja.com, Web: www.maharaja.com

ECN/2022-23/CR-43/1709 10th May, 2022

**CERTIFICATE OF REGISTRATION
FOR CLASS 'A'**


We hereby certify that, the firm having following particulars is registered with **MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm: M/s Engress Services
 Yashshree, 26, Nirmal Bag Society,
 Near Mukangan English School,
 Parvat, Pune - 411 009

Registration Category: Empanelled Consultant for Energy Conservation Programme for Class 'A'

Registration Number: MEDA/ECN/2022-23/Class-A/EA-32.

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till 09th May, 2024 from the date of registration, to carry out energy audits under the Energy Conservation Programme.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.


 General Manager (EC)



GEM Certificate

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

has successfully passed the

Green and Eco-friendly Movement Certified Professional Test (GEM CP)

with

"Excellent Performance"

on

06 June, 2022

He/she is now eligible to execute the GEM Sustainability Certification Projects.

ASSOCHAM feels proud to award the GEM Certified Professional title to him/her.


Pankaj R. Dharkar
Chairman, GEM


Deepak Sood
Secretary General, ASSOCHAM

GEM CP 22/788

MEDA REGISTRATION CERTIFICATE

ASSOCHAM GEM CP CERTIFICATE

Certificate of Registration

This is to Certify that

Quality Management System of

ENGRESS SERVICES

26, YASHASHREE, BLOCK, 1, LOKMANSYA NAGAR, NIRMAL BAGH SOC, PARVAT,
 PUNE- 411009, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of


ISO 9001:2015

for the following scope:

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT
 IN EDUCATIONAL INSTITUTIONS & SUBMISSION OF AUDIT CERTIFICATE AND REPORT

Certificate No:	23EOK13	Issue Date:	27/03/2023
Initial Registration Date:	27/03/2023	Date of Expiry:	26/03/2026
1st Surve. Due:	27/02/2024	2nd Surve. Due:	27/02/2025






Magnitude Management Services Pvt. Ltd.
 B-55, Lower Ground Floor, Sector 62, Noida-201101, U.P. India
 Website: mmsmagnitudeservices.com, www.mmsmagnitudeservices.com
 *Subject to acceptance of the conditions, terms, and any amendments made to our standard by the certificate holder.
 *Certificate holder shall be responsible for the validity of certificate in accordance with ISO 9001:2015.

ISO: 9001-2015 CERTIFICATE

Certificate of Registration

This is to Certify that

Environmental Management System of

ENGRESS SERVICES

26, YASHASHREE, BLOCK, 1, LOKMANSYA NAGAR, NIRMAL BAGH SOC,
 PARVAT, PUNE- 411009, MAHARASHTRA, INDIA





has been assessed and found to conform to the requirements of

ISO 14001:2015

for the following scope:

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT
 IN EDUCATIONAL INSTITUTIONS & SUBMISSION OF AUDIT CERTIFICATE AND REPORT

Certificate No:	23EOKW20	Issue Date:	29/03/2023
Initial Registration Date:	29/03/2023	Date of Expiry:	28/03/2026
1st Surve. Due:	29/02/2024	2nd Surve. Due:	28/02/2025

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ISO: 14001-2015 CERTIFICATE



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ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Maharashtra Cosmopolitan Education Society's M. A. Rangoonwala Institute of Hotel Management & Research Pune, Camp, Pune 411 001, for awarding us the assignment of Green Audit of their Pune Campus for the Year: 2022-23.

We are thankful to all the staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. Maharashtra Cosmopolitan Education Society's M. A. Rangoonwala Institute of Hotel Management & Research Pune, Camp, Pune 411 001 consumes Energy in the form of Electrical Energy & LPG; used for various Equipment.

2. Present Energy Consumption & CO₂ Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	29205	kWh
2	Annual LPG Consumed	1330	Kg
3	Annual CO ₂ Emissions	29.85	MT

3. Renewable Energy & Reduction in CO₂ Emissions:

- The Institute has installed Roof Top Solar PV Plant of Capacity **50 kWp**.
- The Energy generated by Solar PV Plant in 22-23 is **60000 kWh**.
- Reduction in CO₂ Emissions in 22-23 is **54 MT**

4. Waste Management Practices:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Installed Vermi Composting Pit
3	Food Waste	Installed Bio Gas Unit
4	E Waste Management	Disposed by the Society

5. Rain Water Harvesting:

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is run down through Pipes, filtered and is stored in a well & is further used for domestic purpose.

6. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Tree Plantation in the campus.
- Provision of Ramp for Divyangajan
- Creation of awareness on Plastic Free Campus by Display of Posters

7. Assumptions:

1. Electrical Energy consumption is computed based on Capacity Utilization Factor

2. **1 kWh** of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere
3. **1 Kg of LPG** releases **2.68 Kg of CO₂** into atmosphere
4. Energy generated by Roof Top Solar PV Plant: **4 kWh/kWp per Day**
5. Annual Solar Energy generation Days: **300 Nos**

8. References:

- For CO₂ Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in

ABBREVIATIONS

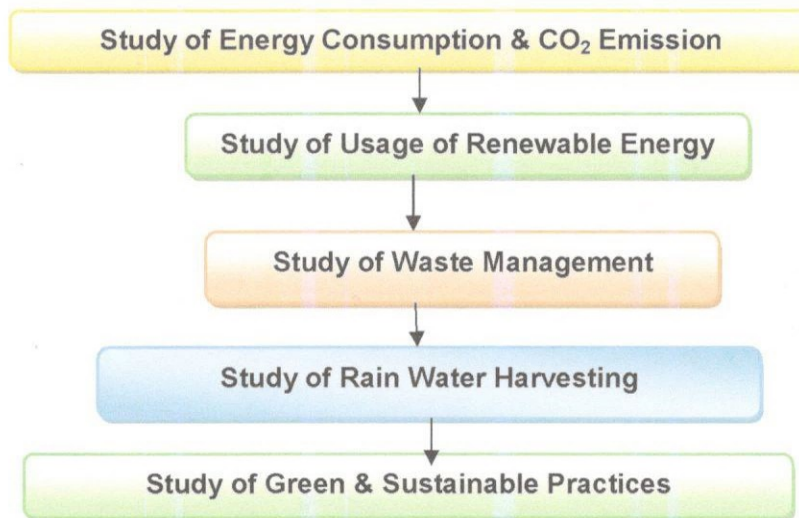
BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
Kg	Kilo Gram
MT	Metric Ton
CO ₂	Carbon Di Oxide
Qty	Quantity

CHAPTER-I INTRODUCTION

1.1 Introduction:

A Green Audit is conducted at Maharashtra Cosmopolitan Education Society's M. A. Rangoonwala Institute of Hotel Management & Research Pune.

1.2 Audit Procedural Steps:



1.3 Institute Location Image:



Institute
Campus



CHAPTER-II

STUDY OF ENERGY CONSUMPTION & CO₂ EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO₂ Emissions:

The basis of Calculation for CO₂ emissions due to Electrical Energy & LPG is:

- 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere
- 1 Kg of LPG releases 2.68 Kg of CO₂ into atmosphere

Based on the above Data we compute the CO₂ emissions which are being released in to the atmosphere by the Institute due to its Day to Day operations

Table.No 1: Month wise CO₂ Emissions:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO ₂ Emissions, MT
1	Apr-22	2295	112	2.37
2	May-22	2336	116	2.41
3	Jun-22	2456	111	2.51
4	Jul-22	2635	111	2.67
5	Aug-22	2239	111	2.31
6	Sep-22	2965	126	3.01
7	Oct-22	2069	124	2.19
8	Nov-22	2375	103	2.41
9	Dec-22	2436	111	2.49
10	Jan-23	2175	115	2.27
11	Feb-23	2239	95	2.27
12	Mar-23	2985	95	2.94
13	Total	29205	1330	29.85
14	Maximum	2985	126	3.01
15	Minimum	2069	95	2.19
16	Average	2433.75	110.83	2.49

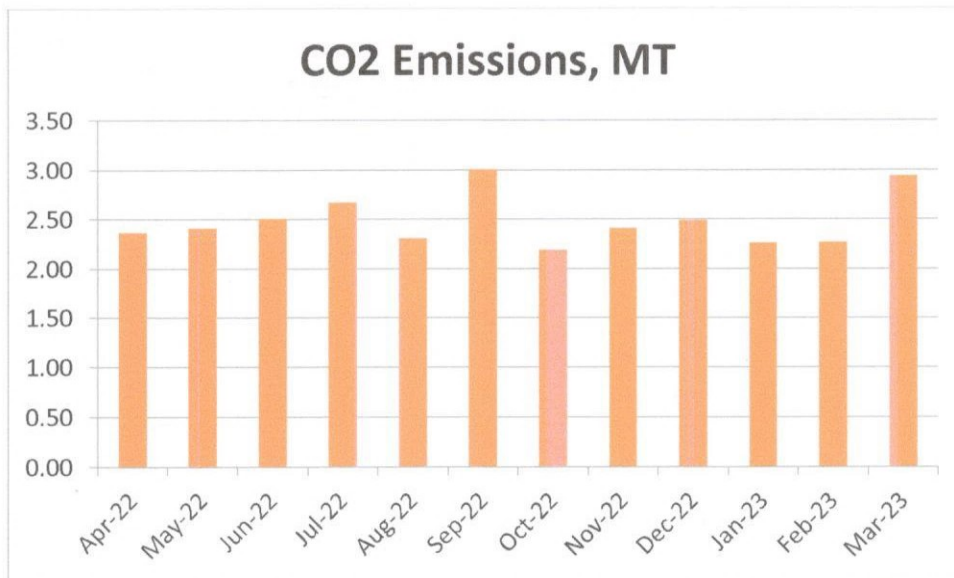
Chart No 1: Month wise CO₂ Emissions:

Table No 2: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO ₂ Emissions, MT
1	Total	29205	1330	29.85
2	Maximum	2985	126	3.01
3	Minimum	2069	95	2.19
4	Average	2433.75	110.83	2.49

CHAPTER III

STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed Roof Top Solar PV Plant of Capacity **50 kWp**

In the following Table, we present the reduction in CO₂ emissions due to Solar Energy:

Table No 3: Computation of Reduction in CO₂ Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	50	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 21-22	60000	kWh
5	1 kWh of Electrical Energy saves	0.9	Kg/kWh
6	Qty of CO₂ Saved by Solar PV Plant = (4)*(5) /1000	54	MT of CO₂

Photograph of Roof Top Solar PV Plant:



CHAPTER IV STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The Institute has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

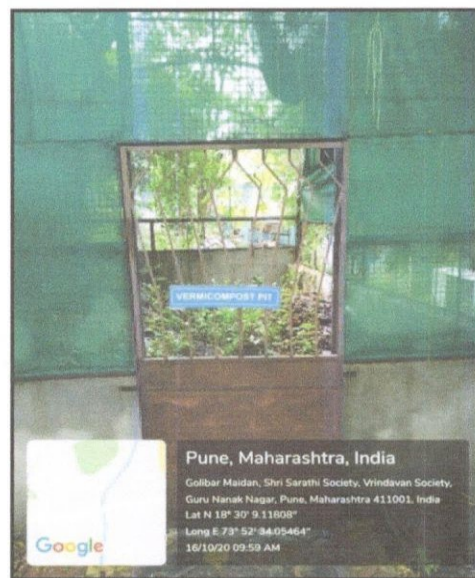
Photograph of Waste Collection Bin:



5.2 Organic Waste Management:

The Institute has installed a Vermi Composting Pit for conversion of Organic Waste.

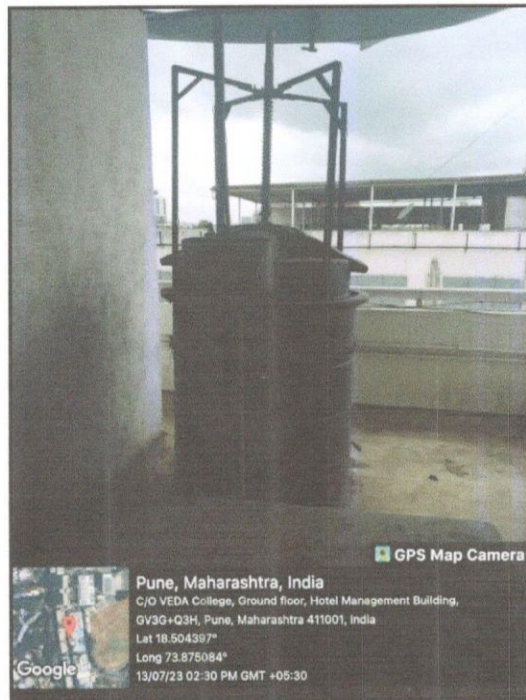
Photograph of Vermi Composting Pit:



5.3 Bio Gas Unit:

The Institute has installed a Bio Gas Unit for conversion of Leftover Food Waste.

Photograph of Bio Gas Unit:



5.4 E Waste Management:

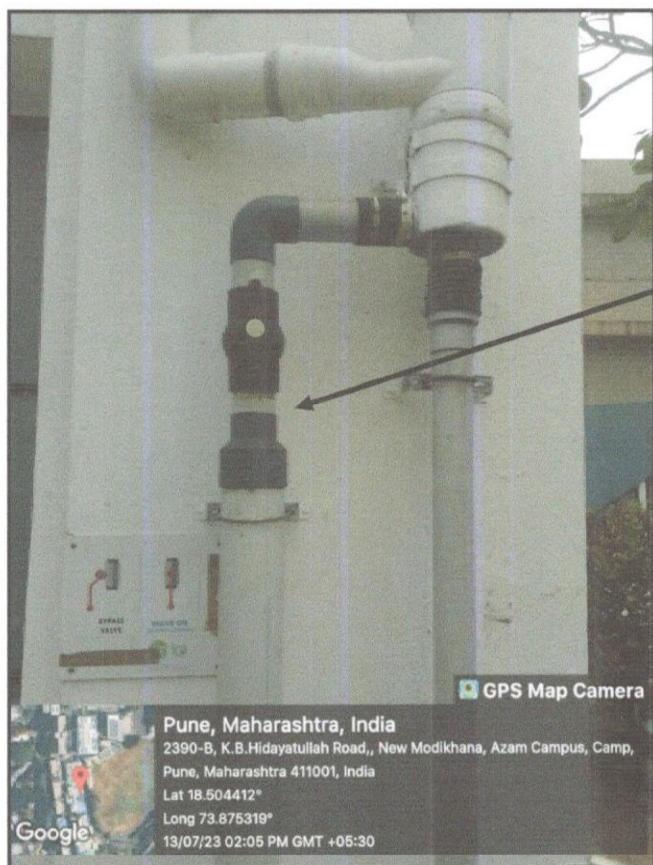
The E Waste is disposed by the Society.



CHAPTER V STUDY OF RAIN WATER HARVESTING

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is run down through Pipes, filtered and is stored in a well & is further used for domestic purpose.

Photograph of Rain Water Carrying Pipe:



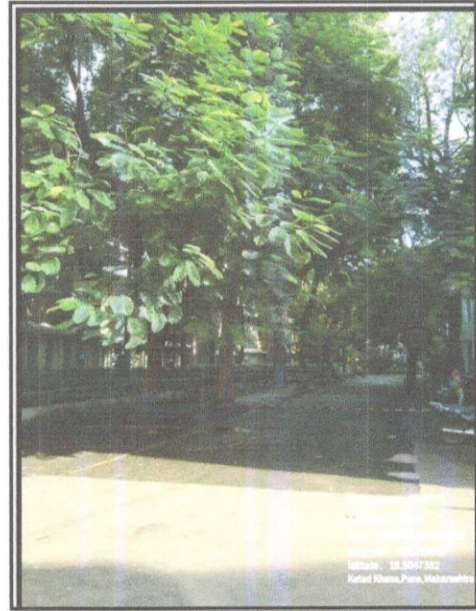
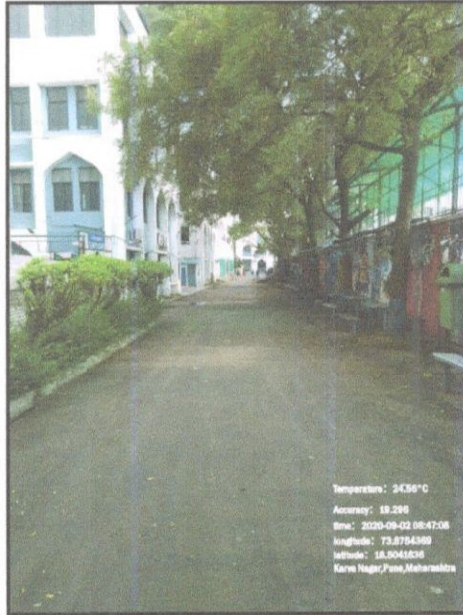
Rain Water Carrying Pipe & Sand Filter Unit

CHAPTER VI STUDY OF GREEN & SUSTAINABLE PRACTICES

6.1 Pedestrian Friendly Road & Internal Tree Plantation:

The Institute has well maintained internal road to facilitate the easy movement of the students within the campus. The Institute has well maintained landscaped garden in the campus.

Photograph of Internal Road & Tree plantation:



6.2 Provision of Ramp for Divyangajan:

For easy movement of Divyangajan, the Institute has made provision of Ramp.

Photograph of Ramp:



6.3 Creation of Awareness Plastic Ban:

The Institute has displayed posters emphasizing on importance of Plastic ban..

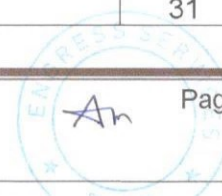
Photograph of Poster on Plastic Ban:



ANNEXURE-1: LIST OF TREES IN THE CAMPUS:

List of Trees in the Campus:

No	Scientific Name	Family	Qty
1	<i>Acacia auriculoformis</i>	Mimosaceae	1
2	<i>Acacia catechu</i>	Mimosaceae	1
3	<i>Adenanthera pavonina</i>	Mimosaceae	1
4	<i>Aegle marmelos</i>	Rutaceae	1
5	<i>Albizzia lebbeck</i>	Mimosaceae	3
6	<i>Alstonia scholaris</i>	Apocynaceae	7
7	<i>Anona squamosa</i>	Anonaceae	1
8	<i>Araucaria heterophylla</i>	Araucariaceae	4
9	<i>Artocarpus heterophyllus</i>	Moraceae	1
10	<i>Azadirachta indica</i>	Meliaceae	34
11	<i>Bauhinia purpurea</i>	Caesalpinaceae	4
12	<i>Bombax ceiba</i>	Bombacaceae	2
13	<i>Brassia actinophylla</i>	Araliaceae	1
14	<i>Caesalpinia pulcherima</i>	Caesalpinaceae	3
15	<i>Calliandra hematocephala</i>	Fabaceae	1
16	<i>Callistemon Citrinus</i>	Myrtaceae	2
17	<i>Caryota urens</i>	Arecaceae	1
18	<i>Cassia siamea</i>	Caesalpinaceae	5
19	<i>Cordia sebastena</i>	Boraginaceae	2
20	<i>Couroupita guianensis</i>	Lecythidaceae	1
21	<i>Delonix regia</i>	Caesalpinaceae	25
22	<i>Erythrina indica</i>	Fabaceae	4
23	<i>Eucalyptus obliqua</i>	Myrtaceae	4
24	<i>Ficus benghalensis</i>	Moraceae	11
25	<i>Ficus benjamina</i>	Moraceae	21
26	<i>Ficus infectoria</i>	Moraceae	1
27	<i>Ficus racimosa</i>	Moraceae	2
28	<i>Ficus religiosa</i>	Moraceae	5
29	<i>Gliricidia sepium</i>	Fabaceae	2
30	<i>Gmelina arborea</i>	Verbenaceae	3
31	<i>Grevillea robusta</i>	Proteaceae	26
32	<i>Hamelia patens</i>	Rubiaceae	1
33	<i>Jacaranda mimosifolia</i>	Bignoniaceae	6
34	<i>Khaya senegalensis</i>	Meliaceae	3
35	<i>Leucaena leucocephala</i>	Mimosaceae	3
36	<i>Livistonia rotundifolia</i>	Arecaceae	5
37	<i>Mangifera indica</i>	Anacardiaceae	3
38	<i>Markhamia platycalyx</i>	Bignoniaceae	1
39	<i>Melia azadirachta</i>	Meliaceae	2
40	<i>Millingtonia hortensis</i>	Bignoniaceae	31



41	<i>Morus alba</i>	Moraceae	6
42	<i>Muntingia calabura</i>	Elaeocarpaceae	3
43	<i>Nyctanthes arbor-tristis</i>	Oleaceae	21
44	<i>Parkia biglandulosa</i>	Mimosaceae	11
45	<i>Peltophorum pterocarpum</i>	Caesalpinaceae	45
46	<i>Pimentia dioica</i>	Myrtaceae	1
47	<i>Pithecellobium dulce</i>	Mimosaceae	1
48	<i>Plumeria rubra</i>	Apocynaceae	4
49	<i>Polyalthia longifolia</i>	Anonaceae	42
50	<i>Pongamia glaBRA</i>	Fabaceae	2
51	<i>Ravengela madagascariensis</i>	Sterculiaceae	1
52	<i>Roystonea regia</i>	Arecaceae	28
53	<i>Samania saman</i>	Mimosaceae	21
54	<i>Santalum album</i>	Santalaceae	3
55	<i>Sapindus laurifolius</i>	Sapindaceae	3
56	<i>Spathodia campanulate</i>	Bignoniaceae	12
57	<i>Sterculia foetida</i>	Sterculiaceae	1
58	<i>syzygium cumini</i>	Myrtaceae	1
59	<i>Tamarindus indica</i>	Caesalpinaceae	1
60	<i>Terminalia arjuna</i>	Combretaceae	1
61	<i>Terminalia cattapa</i>	Combretaceae	2
62	<i>Yucca aloifolia</i>	Agavaceae	2
	Total		449