



MAHARISHI MARKANDESHWAR (DEEMED TO BE UNIVERSITY), MULLANA, AMBALA HARYANA GREEN AUDIT REPORT



Prepared by:

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GREEN AUDIT

MM(DU) conducted a Pre-Green Audit of its campus and facilities in 2019. The university (Internal Green Audit Team) evaluated the issues and is formulating an implementation plan to raise environmental awareness. Rain water harvesting (RWH) system is also implemented in MM(DU) Campus (including main building, different academic departments, medical college & hospital, hostels) for the conservation of water. In order to keep the campus hygienic, clean and free from any sort of pollution, MM(DU) strictly follows the waste management system.

The present audit is a Pre-audit to collect the details required for external auditing and Pre-audit activities. The pre-audit activities include the following.

1. The institute area/division that are to be audited, need to be determined and selected.
2. The auditee was informed of the date of the audit enabled them to adjust and become a part to the concept.
3. The audit plan was designed in such a way that it accommodated changes based on information gathered during the audit and effective use of resources.
4. Green Audit Committee and assignment of responsibility were established.
5. The chosen working papers were collected. This facilitated the auditor's investigations on the sites.
6. The background information on the facility including the facility' organization, layout and processes, and the relevant regulations and standards, were collected.

ONSITE AUDIT ACTIVITIES:

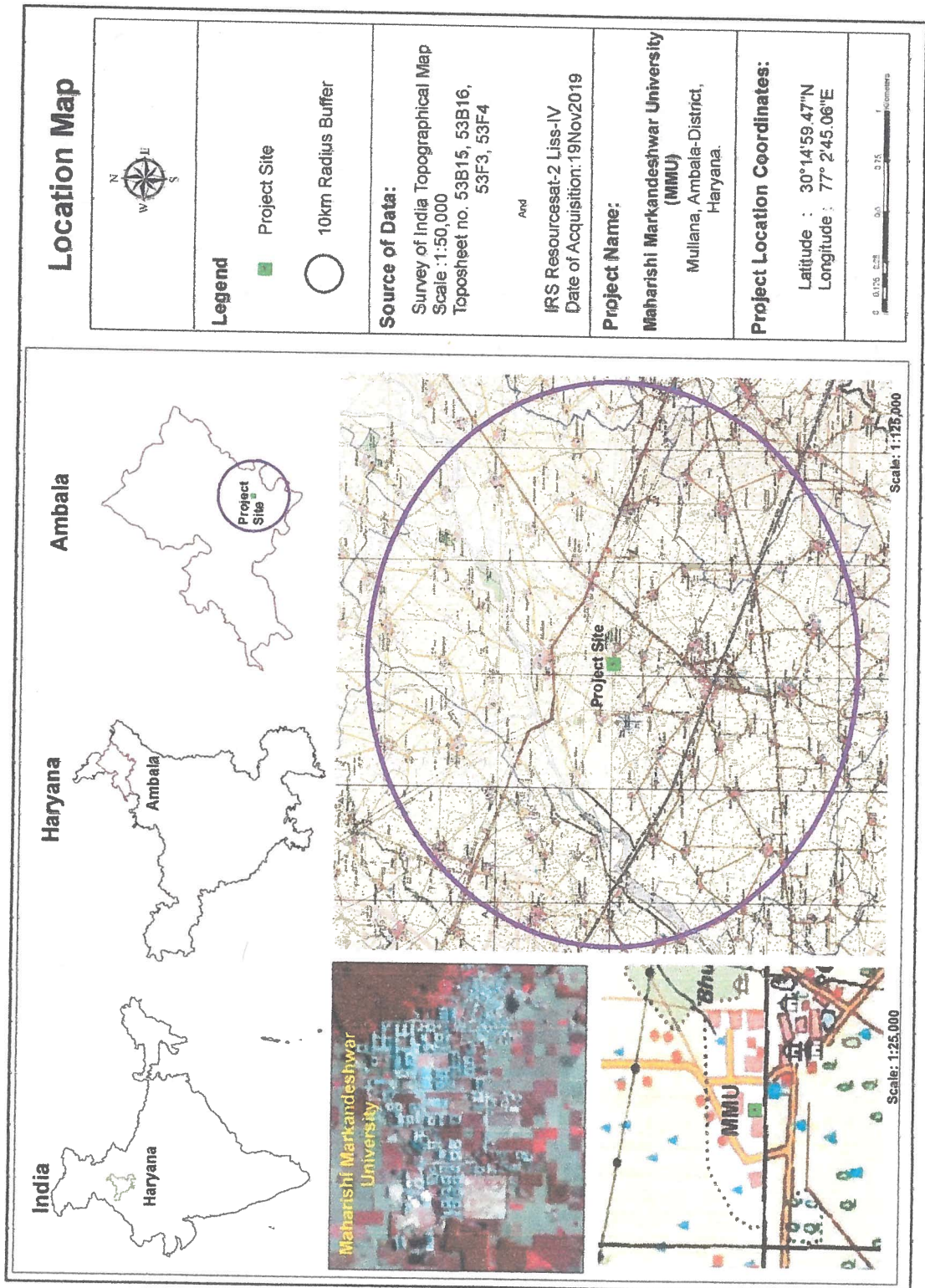
The onsite audit includes

1. The opening meeting is the first step between the Green Audit team and Estate Department. In this meeting the purpose of audit, the procedure and the time schedule were discussed.
2. Site inspection is the second step for onsite activity. In this step the audit team discovered matters which are important to the audit, but which were not identified at the planning stage.
3. Onsite phase of the audit developed a working understanding of how the facility manages the activities that influence the environment.



4. Gathering audit evidence i.e. collecting data and information.
5. Evaluate the audit evidence against the objectives established for the audit.



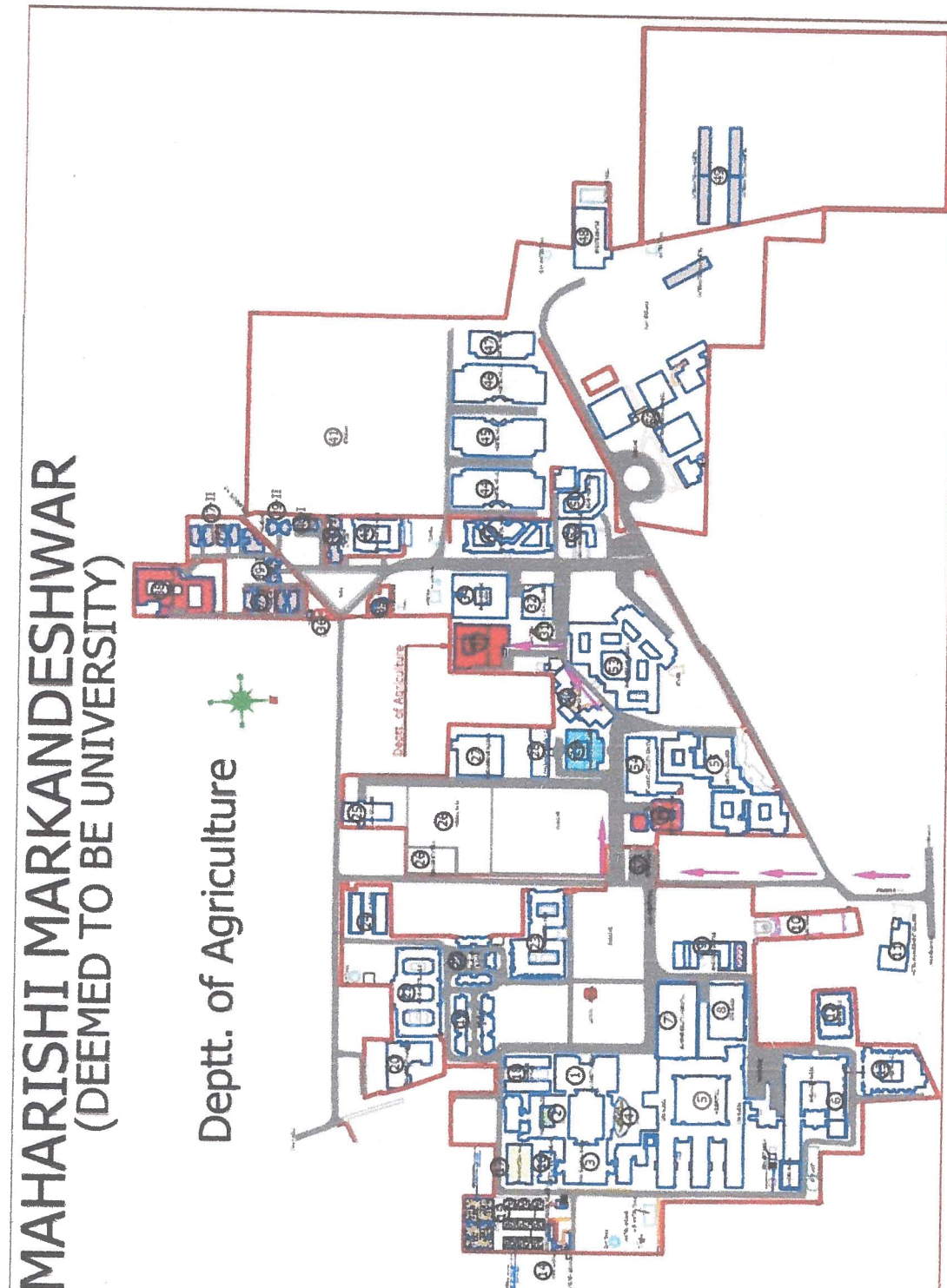


Map 1: Location Map MM(DU)



MAHARISHI MARKANDESHWAR (DEEMED TO BE UNIVERSITY)

Deptt. of Agriculture



S.No	LEGEND
1	ANDRETTI BLOCK
2	RECREATIONAL BLOCK
3	M.A. CLINICAL BLOCK
4	LECTURE THEATRE BLOCK
5	PG BLOCK
6	CASUALTY BLOCK
7	SPECIALITY HOSPITAL
8	OPD BLOCK
9	SHOPPING CENTRE
10	AUDITORIUM
11	HOTEL MANAGEMENT COLLEGE
12	HOSTEL NO. 9
13	HOSTEL NO. 7
14	COURT-YARD
15	HOUSING TYPE
16	INSTITUTE OF NURSING
17	EXAMINATION HALL
18	HOUSING FIVE
19	HOUSING 5 TYPE
20	COLLEGE OF NURSING
21	BOYS HOSTEL NO. 3
22	HOUSING 8 TYPE
23	GIRLS HOSTEL NO. 6
24	PG BLOCK
25	A.V. COLLEGE
26	BEVERIDGE STATISTICAL SERIALS BLDG
27	ENGINEERING BLOCK 3
28	MANAGEMENT BLOCK - B
29	MANAGEMENT COLLEGE
30	HOUSING 6 BLOCK
31	CATERING
32	A.C.A. COLLEGE
33	RESOLUTION BLOCK
34	ENGINEERING BLOCK 1
35	V.C. RESIDENCE
36	TEMPLES
37-1, 37-11	HOUSING 8 TYPE
38	GIRLS HOSTEL NO. 4
39-1, 39-11	HOUSING C TYPE
40-1, 40-11	HOUSING A TYPE
41	WASH-HOUSE
42	BOYS HOSTEL NO. 3
43	BOYS HOSTEL NO. 2
44	HOSTEL NO. 12
45	HOSTEL NO. 11
46	HOSTEL NO. 11
47	HOSTEL NO. 13
48	SPORTS CENTRE
49	INTERNATIONAL HOSTEL
50	M.H. INTERNATIONAL SCHOOL
51	BOYS HOSTEL NO. 1
52	COMMERCIAL COMPLEX
53	ENGINEERING BLOCK 1
54	STUDENT ACTIVITY CENTRE
55	DENTAL COLLEGE
56	GIRLS HOSTEL NO. 5
57	PETROL PUMP

Map 2: Layout map of MM(DU)





Map 3: Google Image Map of MM(DU), Mullana



Land use/ Land Cover Map

Key Map









Satellite Map



Scale: 1:15,000



Legend

-  MMU
-  Road
-  Building Blocks
-  Green Belt Area
-  Play Ground
-  Water Tank
-  Open Land
-  Parking Area

Project Name:

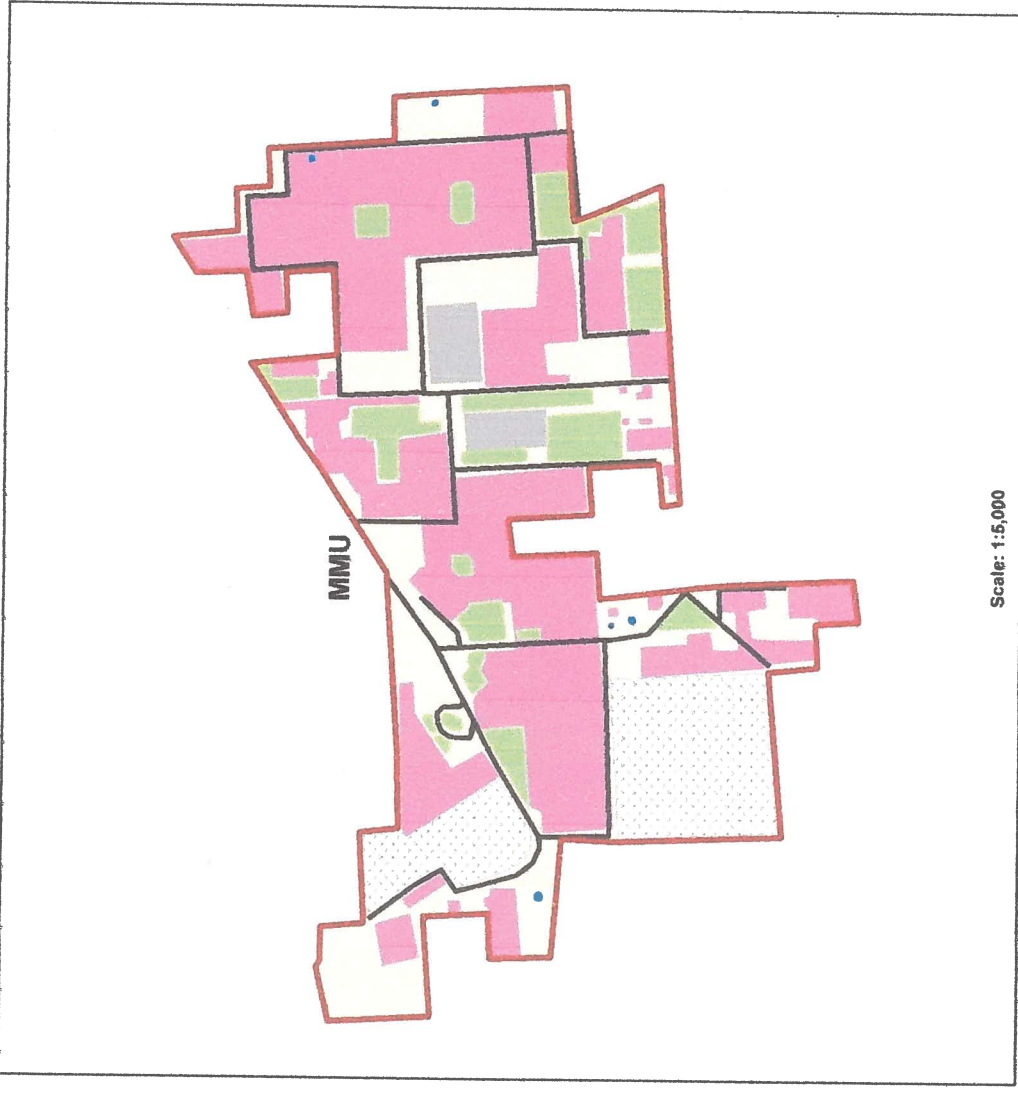
**Maharishi Markandeshwar University
(MMU)**

Mullana, Ambala-District,
Haryana.

Project Location Coordinates:

Latitude : 30°14'59.47"N

Longitude : 77° 2'45.06"E



Scale: 1:5,000



Map 4: Land use map of MM(DU)



Table 1: Land Use/ Land Cover Classification

S.No.	Class	Area in Ha	Percentage
1	Building Blocks	25	47.17
2	Play Ground	7	13.21
3	Green Belt Area	6	11.32
4	Open Land	13	24.53
5	Parking Area	2	3.77
Total		53	100

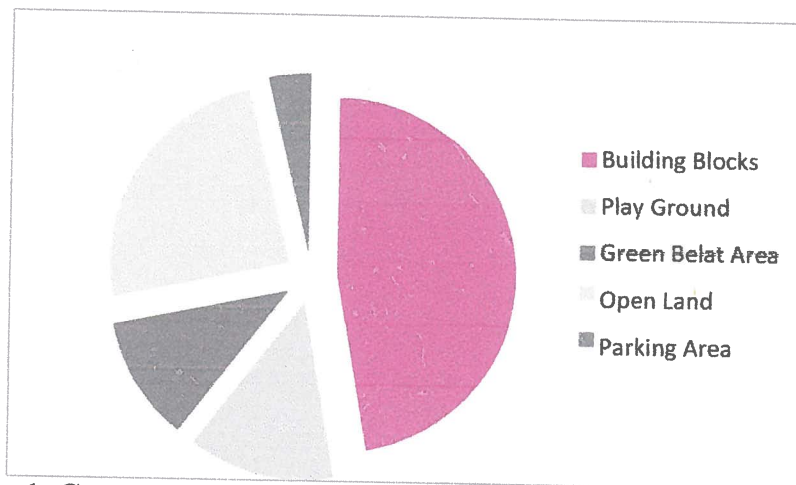


Figure 1: Graphical Presentation of Land Use/ Land Cover classification

PROCEDURE FOLLOWED:

A team was formed consisting of two members under the guidance of the Mrs. Daksha Gupta, both the groups collected data on the assigned topics. The assigned areas are as follows.

1. Identification of plant species and biodiversity.
2. Analysis of water quality and usage.

Based on our assessment, the different sources of carbon-dioxide emitted to our university are:

1. 82 Vehicles
2. 16 DG sets
3. Electric Motors
4. Refrigerators
5. Air conditioners
6. RO water Plants



Total number of Vehicles (Ambulances and college busses) and other institutional vehicles for officers are 82, approx.400 no. of private vehicles. There are 300 number of bikes and scooters in the MM(DU) campus, which in turn proves us that these vehicles may contribute to high carbon-dioxide emission. There are 450 refrigerators, 400 No. of air conditioners in the MM(DU) campus. The students, teaching and non-teaching staff and the visitors also contribute to carbon-dioxide emission.

INITIATIVES TAKEN BY THE UNIVERSITY TO MAKE THE CAMPUS GREEN

Water Management:

- Fresh water requirement of MM(DU) campus is max. 1137.15 KLD and the requirement of treated/ recycled water is 885.15 KLD.
- The water demand is met through 4 numbers of Bore wells installed within the campus. Total 1137.15KLD water is extracted from the bore-wells.



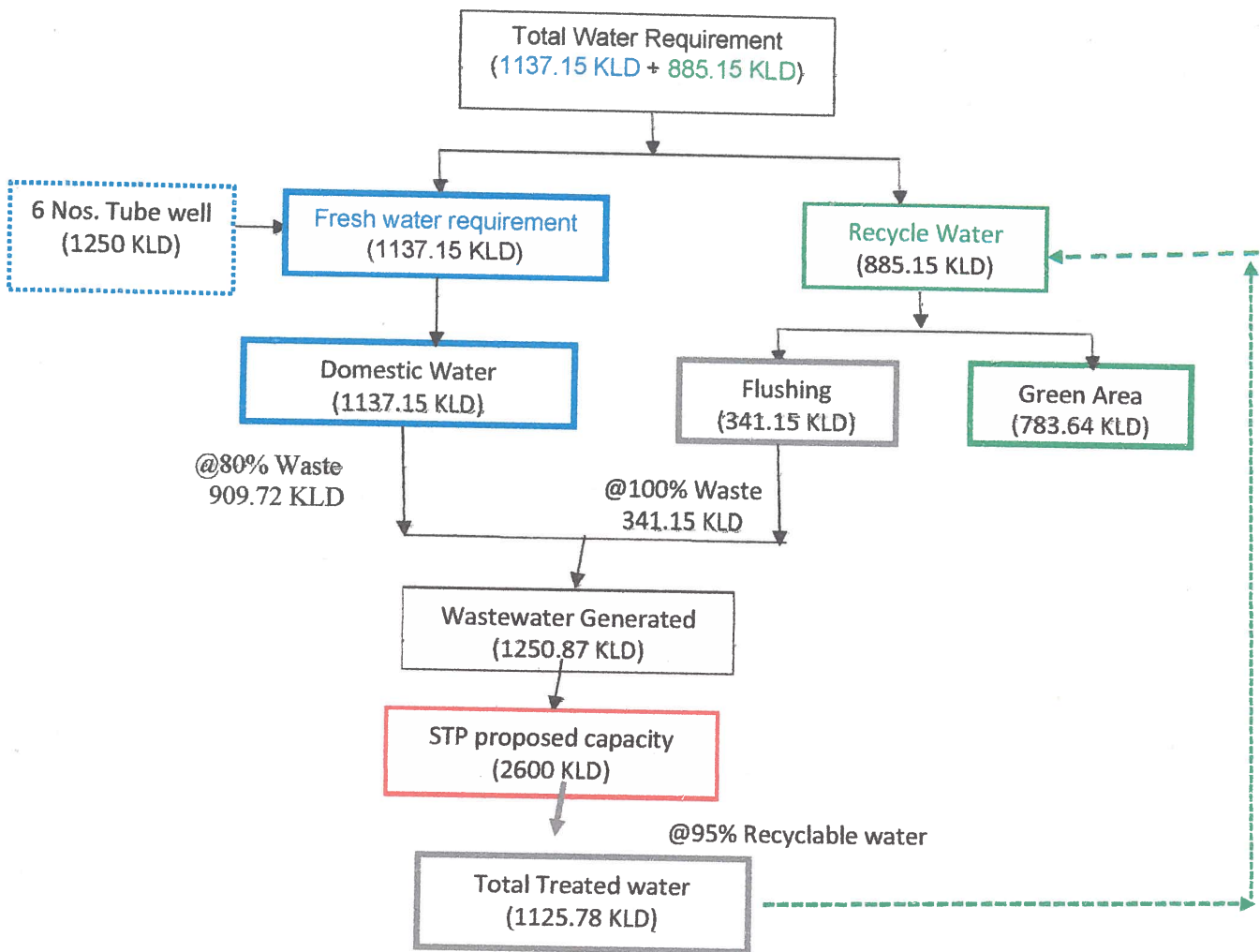


FIGURE 2: WATER BALANCE

TABLE 2: WATER REQUIREMENT

S.No.	Particulars	Occupancy	Rate of water demand	Total Water Requirement	Water Requirement (KLD)	
				(KLD)	Domestic	Flushing
					(Fresh Water)	(Recycled Water)
1	Hospital	940	450	423	296.1	88.83
2	OPD	2000	45	90	63	18.9
	Students	6700	45	301.5	211.05	63.315
3	Residence	300	135	40.5	28.35	8.505
4	Hostel	5000	135.9	675	472.5	141.75



5	Floating population (Staff)	2000	45	90	63	18.9
6	Visitor	300	15	4.5	3.15	0.945
Total					1137.15	341.15
Green Area			181400.00 Sq.m.	4.32 l/sq.m.		783.64

WATER HARVESTING

Rainwater Harvesting System

There are 12 rainwater harvesting collection points followed by 2 storage tanks of capacities 15000 and 25000 litres.

TABLE 3: RAINWATER HARVESTING AREA

S.No.	Details	Values
1	Roof top Area (m ²)	152875
2	Green/Open Land Area (m ²)	188400
3	Road/Paved area(m ²)	109795
4	Average Annual rainfall for Ambala District (Source: CGWA Distt. Ambala)	1.076 m (1076 mm)
5	Co-efficient of evaporation, spillage and first flush wastage	0.8
6	Runoff coefficient for roof top (0.7-0.9)	0.8
7	Runoff coefficient for paved area (0.5-0.7)	0.6
8	Runoff coefficient for open land (0.3-0.6)	0.3

The rainwater harvesting will be done from the Rooftop area, Green Area, Paved Area.

TABLE 4: RAIN WATER HARVESTED

S.No.	Details	Calculation	Rainfall Runoff (m ³ /Annum)	Rainfall Harvested @70% Fraction (m ³)
1	Roof top Area	152875x1.076x0.8	131594.8	92116.36
TOTAL				92116.36

Total available rainwater for year = 92116.36 KLY Considering water available for one day = **252.34 KLD**

Available rainwater harvesting tank capacity: **250 KLD**



EFFORTS FOR CARBON NEUTRALITY

The Carbon Neutrality or having a net zero carbon footprint refers to achieving net zero carbon emissions by balancing carbon released with an equivalent sequestered or offset method. Simply, Carbon neutral means removing as much carbon dioxide from the atmosphere as we put in.

Carbon emission processes on the campus:

There are no direct carbon emission processes or activities in the campus except the use of LPG in canteen & hostel Kitchen and limited movement of vehicles. The use of electricity, water and stationery are resulting in the carbon emission indirectly.

- The major sources of direct Carbon emission are from the petrol/diesel driven vehicles, human breathing, consumption of LPG, waste disposal and indirect sources are electricity, paper/stationary, etc.

Carbon offsetting initiatives:

1) Increasing vegetation on the campus:

- MM(DU) is situated in a lush green environment.
- Every building in the Campus is surrounded by trees and lawns.
- Well planned plantation of wide varieties of trees and shrubs decorate the campus and the campus looks beautiful.
- Plantation programmes are undertaken on the campus to increase the number of plants.
- Varieties of plant species are used in the campus for the development of green belt. Vertical gardening comes in practice within the campus.
- Total green belt area measuring **1,88,400 Sq.mtr** all over the campus with varieties of species.

Plantation:

Out of total campus area of 451071.30 sq.m. area earmarked for green belt and landscaping is 188400 Sq.mtr. There are total 33410 no. of plants of 156 species in the campus. Out of this 3646 trees, 577 are shrubs, 11966 are herbs and remaining 221 are climbers. Out of 3646 trees, 210 trees are present in the botanical garden. 33410 plants in MM(DU) Mullana contribute to the Oxygen supply that people utilize.

Based on site survey following plant species was observed.



TABLE 5: IDENTIFICATION OF PLANT SPECIES AND BIODIVERSITY IN THE MM(DU), MULLANA CAMPUS

S.No.	Scientific Name	Common Name
1	<i>Polyalthia longifolia</i>	Ashoka
2	<i>Acoelorrhaphe wrightii</i>	Everglades palms
3	<i>Terminalia arjuna</i>	Arjuna
4	<i>Dalbergia sissoo</i>	Shisham
5	<i>Borassus flabellifer</i>	Tal
6	<i>Ficus benjamina</i>	Weeping fig
7	<i>Phyllanthus emblica</i>	Amla
8	<i>Terminalia chebula</i>	Harad
9	<i>Delonix regia</i>	Gulmohar
10	<i>Thuja compacta</i>	Green morpankhi
11	<i>Duranta spp.</i>	
12	<i>Celtis australis</i>	Khirk
13	<i>Eucalyptus spp.</i>	
14	<i>Plumeria pudica</i>	Wild plumeria
15	<i>Hibiscus rosa-sinensis</i>	China rose
16	<i>Ipomoea carnea</i>	Bush morning glory
17	<i>Cassia fistula</i>	Amaltas
18	<i>Ailanthus spp.</i>	
19	<i>Plumeria alba</i>	white frangipani
20	<i>Rosa indica</i>	Rosa indica
21	<i>Cascabela thevetia</i>	Peeli Kaner
22	<i>Catharanthus roseus</i>	Bright eyes
23	<i>Combretum indicum</i>	Rangoon creeper
24	<i>Lilium spp.</i>	
25	<i>Dracaena trifasciata</i>	Snake plant
26	<i>Melaleuca viminalis</i>	Weeping bottlebrush

The other variety includes ornamental flowering trees like Amaltas, Golmohar, Arjuna, Bottlebrush, etc.

Being situated in the village area, the MM(DU) is devoid of various atmospheric pollutants from vehicles as well as by other external means.

- Tree plantation activity is regularly undertaken in the campus. The campus has a comforting lush green environment. The university lawns are well maintained, and Gardeners are appointed to take good care of the greenery of the campus.

Apart from the above plantations, lawns are being maintained in front of many departments in MM(DU) campus with flower pots and seasonal. Both sides of large lawns are planted with rows of trees and whole campus is surrounded by canopy of trees.



FIGURE 3: GARDENS IN THE CAMPUS



FIGURE 4: PLANT NURSERY



The open spaces in the campus is either covered with grass in the shape of lawns, garden or paved mostly with colorful locked tiles to which makes the entire campus not only dust free but also enhances esthetic beauty of the area.

Various initiatives taken by the university to make the campus eco-friendly:

- Cleanliness Drive
- Tree plantation at a regular interval

Observation:

1. There are enough water outlets for the Hospital, students, staff and all the departments. But it is essential to check whether all these are working or not and whether the taps are leaking or not.

ECO CLUB- THE ENVIRONMENTAL CLUB

The idea behind creation of an environmental club is to sensitize the students about eco-friendly activities and encourage them to work with ecology-economy balance in mind. The club meets between two to four times per month.

INSTITUTE SOCIAL RESPONSIBILITY

The NSS volunteers at MM(DU) are involved in activities such as

- Spreading awareness towards Swachh Bharat Abhiyaan, SWADHAR Greh etc.
- Planting trees

Fortunately, the students, Teaching and Non-Teaching staff of the college are available to clean the MM(DU) campus.

