



MUKAND LAL NATIONAL COLLEGE

(Affiliated to Kurukshetra University, Kurukshetra) Estd. 1955
YAMUNA NAGAR – 135 001 (Haryana)

Ph : (Off.) 01732-220960, 225560

E-mail : principal@mlncollegeynr.ac.in, principal.mlncynr@gmail.com

•Web : www.mlncollegeynr.ac.in

Criterion 7 – Institutional Values and Best Practices

7.1.3 Quality audits on environment and energy regularly undertaken by the Institution.

Report of the Green Audit.

Principal

Mukand Lal National College,
YAMUNA NAGAR (Haryana)

Dr. Ritu Kumar

Principal (Offg.)



**Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22**



**GREEN AUDIT REPORT
CONSULTATION**



**Mukand Lal National College
Yamuna Nagar, Haryana, 135001**

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

Flat No. 201, OM Apartment, 214 Indrapuri Colony, Bhawarkuan,
Indore – 452 001 (M. P.), India 0731-4948831, 7869327256

Email ID: eempirical18@gmail.com

www.eeplgroups.com

(2021-22)



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



CONTENTS

Sr.No.	Items	Page No
I	ACKNOWLEDGEMENT	3
II	The Audit Team	4
III	Green Monitoring Committee	5
IV	Executive Summary	6
Chapter-1	Introduction	7
1.1	About College	7-11
1.2	About Green Auditing	12
1.3	Objectives of Green Audit	13
1.4	Target Areas of Green Auditing	13
Chapter-2	GREENCAMPUS and Audit	14
2.1	Green Audit	14
2.2	List of Plants in College Campus	14-16
Chapter -3	Renewable Energy and Sustainable Developments	19
3.1	Grid Connected Solar Photovoltaic System	19-22
Chapter-4	CARBONFOOTPRINT	23
4.1	About Carbon Foot Print.	23
4.2	Methodology and Scope	24
4.3	Carbon Emission from Electricity	25
4.4	Carbon Emission from DG sets	26
4.5	Biomass Calculation of Trees	27
4.6	Other Emissions Excluded	35
Chapter-5	WASTEMANAGEMENT	36
5.1	About Waste	36
5.2	Waste Management Practices Adopted by the College	37
5.3	Department and Building Waste Collection Points	38
5.4	Vermi Compose	39
Chapter-6	Air Quality Measurement	40
Chapter-7	RECOMMENDATIONSANDSUGGESTIONS	41
7.1	QR Code System	41
7.2	Other Suggestions	42



**Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22**



ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore takes this opportunity to appreciate & thank the **Mukand Lal National College, Yamuna Nagar, Haryana** for giving us an opportunity to conduct green audit for the college.

We are indeed touched by the helpful attitude and co-operation of all faculties and technical staff, who rendered their valuable assistance and co-operation the course of study.

Rajesh Kumar Singadiya

(Director)

M.Tech (Energy Management), PhD (Research Scholar) Accredited Energy Auditor [AEA0284]
Certified Energy Auditor [CEA-7271]
(BEE ,Ministry of Power ,Govt. of India)
Empanelled Energy Auditor with MPUVN, Bhopal
M.P. Lead Auditor ISO50001:2011 [EnMS) from FICCI,
Delhi Certified Water Auditor (NPC, Govt of India)
Chartered Engineer [M-1699118], The Institution of Engineers (India)
Member of ISHRAE [5815]



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



Audit Team

The study team constituted of the following senior technical executives from **Empirical Exergy Private Limited,**

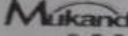
- ✚ **Mr. Rakesh Pathak,** [Director& Electrical Expert]
- ✚ **Mr. Rajesh Kumar Singadiya**[Director & Accredited Energy Auditor AEA-0284]
- ✚ **Mr. Sachin Kumawat** [Sr. Project Engineer]
- ✚ **Mrs. Laxmi Raikwar Singadiya** [Energy Engineer]
- ✚ **Mr. Charchit Pathak** [Mechanical Engineer]
- ✚ **Mr. Akash Kumawat** [Jr. Engineer]
- ✚ **Mr. Ajay Nahra**[Sr. Accountant]



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



Green Monitoring Committee


MUKAND LAL NATIONAL COLLEGE
(Affiliated to Kurukshetra University, Kurukshetra)
YAMUNA NAGAR - 135 001 (Haryana) Estd. 1955
Ph. : (Off.) 01732-220960, 225560
E-mail : principal@mlncollegeynr.ac.in, principal.mlncynr@gmail.com • Web : www.mlncollegeynr.ac.in

Ref. No. _____ Date _____

September 21, 2022

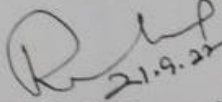
NOTICE

An Energy, Green and Environmental audit committee is formed in the college. It includes the following teachers:

1. Dr. Ritu Kumar *Ritu*
2. Dr. Rachna Aggarwal (IQAC incharge)
3. Mrs. Sunita Sikri *Sunita*
4. Dr. Rahul Singh *Rahul*
5. Dr. Rameshwar Groach
6. Sh. Gurmeet Singh

The following non-teaching staff is also deputed for helping to collect the data:

1. Sh. Ram Pratap
2. Sh. Ajay Kumar
3. Sh. Ajit Kumar
4. Sh. Asha Ram


(Dr. Rahul Khanna)
Offg. Principal

EXECUTIVE SUMMARY

Green Initiatives Taken by College

+ CAMPAIGN OF PLANTATION AND GREEN CAMPUS:

College has around **572** trees in the campus. It is good initiative taken by management for green campus under the campaign of plantation. **It is APPRECIABLE.**

+ 226 KWp SOLAR PHOTOVOLTAIC ROOFTOP INSTALLATION:

College has installed grid connected solar system with capacity 226 KWp on various building. Total unit generation is 4, 93,432 units from date of solar installation **.Its Appreciable.**

AREAS FOR IMPROVEMENT

+ 5 Dust Been System

It is observed that college has adopted single dust been system for all kind of waste generated in college campus. It is recommended to use 5 dust been system for segregation of all type of waste

+ QR Code System on Tree:

While the world seems to be going digital, people lack the time to read books and process the information they contain. Hence, College can provide QR codes on the trees for its information and to exploit the rapidly growing platform for a unique purpose.

+ Eco-restoration programmes

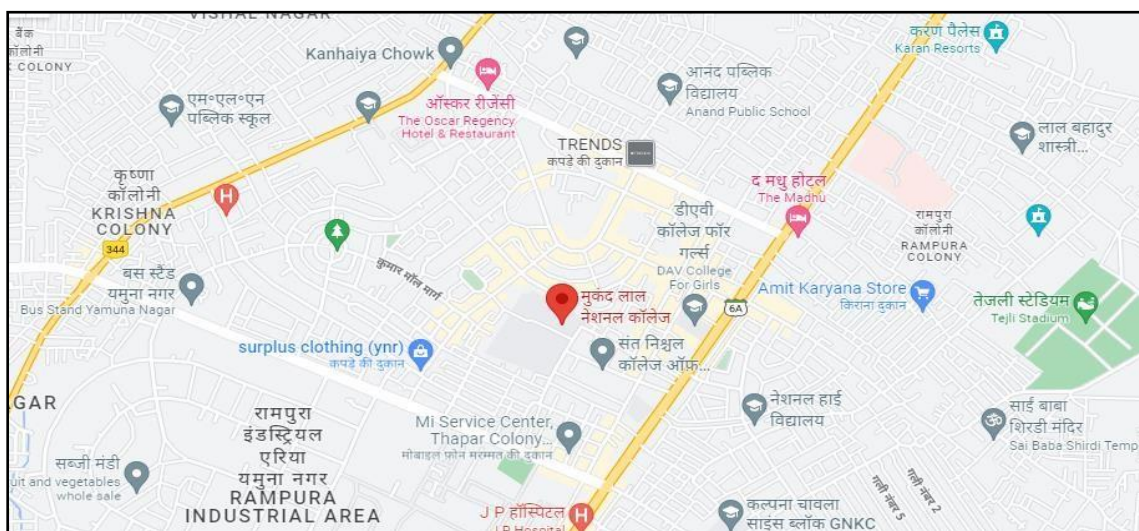
Frame a holistic campus development plan with long-term eco-restoration programmes for replacing exotic acacia plantations with indigenous trees.

CHAPTER-1 INTRODUCTION



1.1 About College

Mukand Lal National College was established in 1955 by a great visionary and educationist Seth Jai Prakash Ji in the cherished memory of his illustrious father Seth Mukand Lal Ji, who was a renowned Gandhian and philanthropist. From the founder Principal Mr. R.N. Rihan, Prof. Tilak Raj Chadha took over the charge. He and his successors, Dr. B.K. Chanan, Dr. K.L. Johar ,Dr. Ramesh Kumar and Dr. Shailesh Kapoor with the able support and magnanimity of Chairman, Seth Ashok Kumar Ji coupled with unstinted support of faculty members have succeeded in carving a niche for the college as a premier institute of higher education in Northern India. The present incumbent, has taken the baton from his illustrious predecessors with the mission of carrying the College to still greater heights with the blessings and guidance of Sh. Ashok Kumar, Chairman, and day to day active support from Dr. Ramesh Kumar, General Secretary, College Managing Committee coupled with full support from the experienced and dedicated faculty. During the course of its long journey, the College has scaled towering heights in academics, sports, co-curricular activities and social service and its alumni has made a mark in different fields of public service and public life.

The college has been declared as College with Potential for Excellence (CPE) by the University Grants Commission of India, New Delhi.



Source : Satellite Image of MLN College from Google map

	Green Audit Report Mukand Lal National College Yamuna Nagar , Haryana 2021-22	
---	--	---

Vision



To impart Quality Education through Time-tested Traditions blended with latest Innovations to transform Youth into Human Resource that is Responsive to Societal, Environmental and Cultural Responsibilities.

Mission

To build State-of-the-art Infrastructure, engage Dynamic and Dedicated Faculty and inculcate Scholarly Pursuits and Human Values in the Young Minds and imbibe them with Qualities, both of Head and Heart, so that they emerge as assets to National Pride and challenge to International benchmarks.

Objective

To remain committed to excellence in imparting Quality Education, promoting Research Culture, ensuring Transparent Governance and focusing on the dimensions of Studies, Sports, Stage and Social Service, for the Holistic Development of Student's Personality.

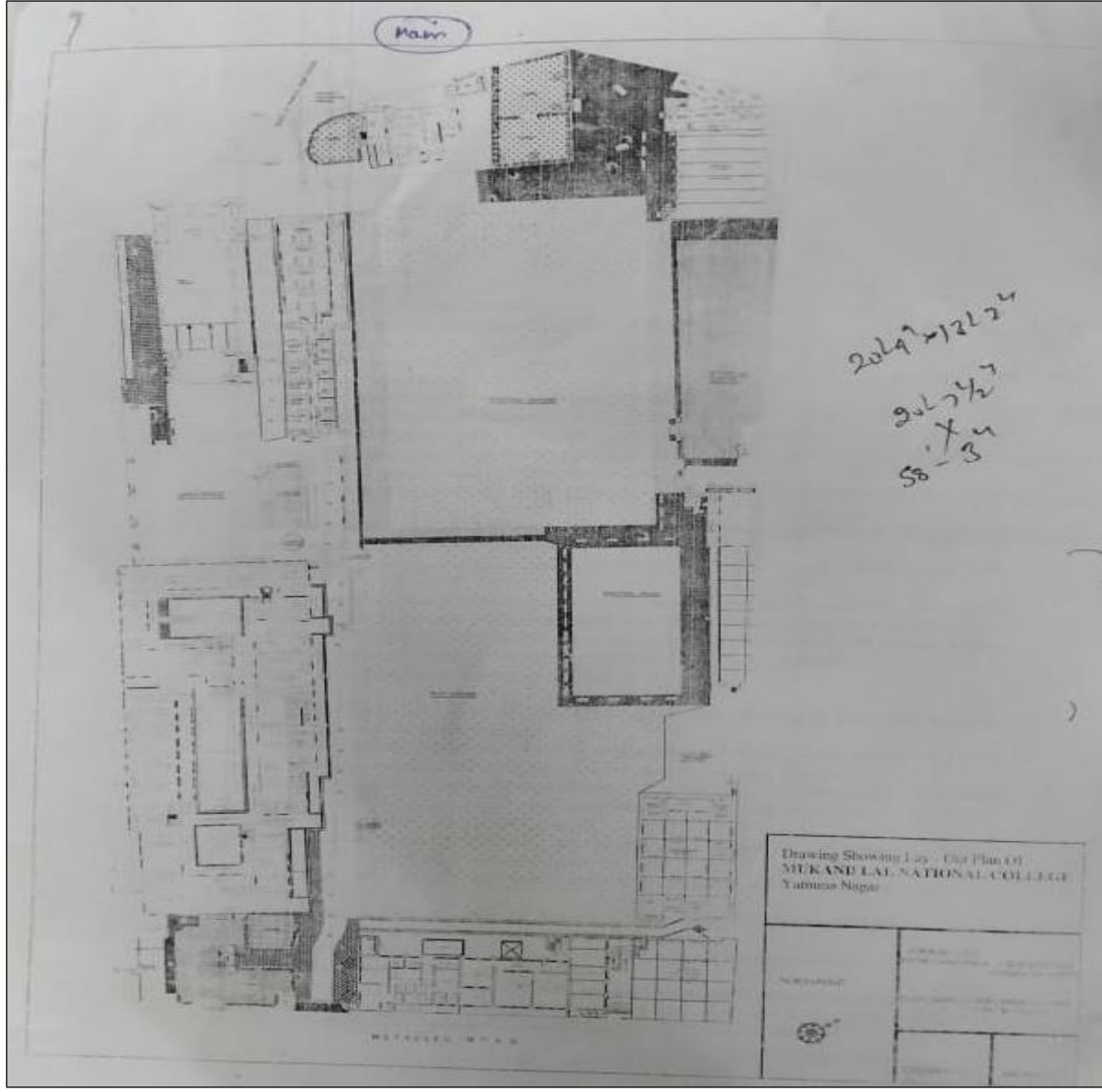
	Green Audit Report Mukand Lal National College Yamuna Nagar , Haryana 2021-22	
---	--	---

College Area

Details are the total build-up area given in the table:-

Total Covered area		33070.91 SQ. MT.	
Total Build Area		17215.52 SQ. MT.	
S.NO	BLOCK	BUILD UP AREA	
		GROUND FLOOR AREA IN SQ.MT	FIRST FLOOR AREA IN SQ.MT
1	Cafeteria	3873.35	NA
2	Commerce Block	3561.41	2976.63
3	Admin Block	1440.93	1389.15
4	Arts Block	353.15	NA
5	Gymnasium	755.64	567.73
6	Sub Station Room	171.96	NA
7	Stadium Block	504.51	524.88
8	PG Block	728.01	368.17

Layout of college campus



1.2 About Green Auditing

Eco campus is concepts implemented in many educational institutions, all over the world to make them sustainable because of their mass resource utilization and waste discharge in to the environment.

Green audit means to identify opportunities to sustainable development practices, enhance environmental quality, improve health, hygiene and safety, reduce liabilities achieve values of virtue. Green audit also provides a basis for calculating the economic benefits of resource conservation projects by establishing the current rates of resource use and their associated costs.

Green auditing of “ **Mukand Lal National College, Yamuna Nagar, Haryana**” enables to assess the life style, action and its impact on the environment. This green audit was mainly focused on greening indicators like utilisation of green energy (solar energy) and optimum use of secondary energy sources (petrol and diesel) in the University campus, vegetation, and carbon foot print of the campus etc. The aim of green auditing is to help the institution to apply sustainable development practices and to set examples before the community and young learners.

1.3 Objectives of Green Auditing

The general objective of green audit is to prepare a baseline report on “Green campus” and alternative energy sources (solar energy), measures to mitigate resource wastage and improve sustainable practices.

The specific objectives are:

- ✚ To inculcate values of sustainable development practices through green audit mechanism.
- ✚ Providing a database for corrective actions and future plans.
- ✚ To identify the gap areas and suggest recommendations to improve the green campus status of the Colleges

1.4 Audit of Green Energy

According to the **Environmental Protection Agency (EPA)**, green energy provides the highest environmental benefit and includes power produced by solar, wind, geothermal, biogas, low-impact hydroelectric, and certain eligible biomass sources. Green energy can also reduce your carbon footprint and achieve a sustainable lifestyle.



CHAPTER- 2
GREEN CAMPUS

2.1 Green Audit

In the survey, focus has been given on assessment of present status of diversity in form of plants, in college campus and efforts made by the college authorities for nature conservation. Campus is located in the vicinity of approximately more than **572** trees, medicinal herbs, ornamental plants. The detail is given below

List of plants in College campus

Sr. No.	Common Name	Botanical or Family Name	Total Number
1.	The Cuban royal palm or Florida royal palm	Roystonea regia	70
2.	Weeping Fig, Ficus sp. (Green Ficus /Black Ficus /Starlight)	Ficus benjamina	230
3.	Pinwheel flower, Crape Jasmine	Tabernaemontana divaricata	6
4.	Oleander	Nerium oleander	5
5.	Areca palm or cane palm, areca palm, yellow palm, butterfly palm, or bamboo palm	Dypsis lutescens	13
6.	Crape myrtle or Giant crepe-Myrtle	Lagerstroemia speciosa	1
7.	Juniperous orJuniper	Juniperous erecta	7
8.	Mango	Mangifera indica	15
9.	Casuarina	Casuarina equisetifolia	4
10.	The Asian bayberry	Nageia nagi	1
11.	Chukrasia or The Indian Mahogany	Chukrasia tabularis	1
12.	Powderpuff	Calliandra haematocephala	3
13.	The bayur tree or karnikara Tree	Pterospermum acerifolium	4
14.	Kachnar	Bauhinia variegata	1
15.	Teak	Tectona grandis	1
16.	Kadamba, Burflower-tree	Neolamarckia cadamba	1
17.	China rose	Hibiscus rosa-sinensis	12



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



Sr. No.	Common Name	Botanical or Family Name	Total Number
18.	Camphor or Kapur	Cinnamomum camphora	2
19.	Yellow oleander	Cascabela thevetia (syn: Thevetiaperuviana)	8
20.	Amaltas, Golden tree	Cassia fistula	3
21.	Thuja	Thuja occidentalis	1
22.	Peregrina, Jatropha	Jatropha integerrima	3
23.	Gulmohar Tree	Delonix regia	5
24.	Parijatak Plant, Harsringar	Nyctanthes arbor-tristis	2
25.	Plumeria, Frangipani	Plumeria pudica	39
26.	Blackboard tree, Scholar Tree, Milkwood or devil's tree	Alstonia scholaris	13
27.	Pepal	Ficus religiosa	2
28.	Silk oak or silky oak, silver oak	Grevillea robusta	2
29.	Albizia	Albizia lebbeck	2
30.	The tree jasmine or Indian cork tree	Millingtonia hortensis,	1
31.	Lemon	Citrus limon	2
32.	Rudraksha tree	Elaeocarpus angustifolius	1
33.	Neem	Azadirachta indica	5
34.	Norfolk Island pine	Araucaria heterophylla	2
35.	Curry Leaf Tree	Murraya koenigii	1
36.	Yellow bells	Tecoma stans	6
37.	Banyan tree	Ficus benghalensis	1
38.	Magnolia, Champa	Magnolia grandiflora	5
39.	Fan Palm	Livistona chinensis	9
40.	Mulberry	Morus alba	1
41.	Mahua	Madhuca longifolia	1
42.	Nagkesar	Mesua ferrea	1
43.	Arjun	Terminalia arjuna	1
44.	Jack Fruit Tree	Artocarpus heterophyllus	1
45.	Amla	Emblica officinalis	1
46.	Teak	Tectona grandis	1
47.	Cinnamon, Dalchini	Cinnamomum zeylanicum	2
48.	Horseradish tree or Drumstick tree	Moringa oleifera	2
49.	Allspice or Jamaica pepper	Pimenta dioica	1
50.	Jacaranda	Jacaranda mimosifolia	1



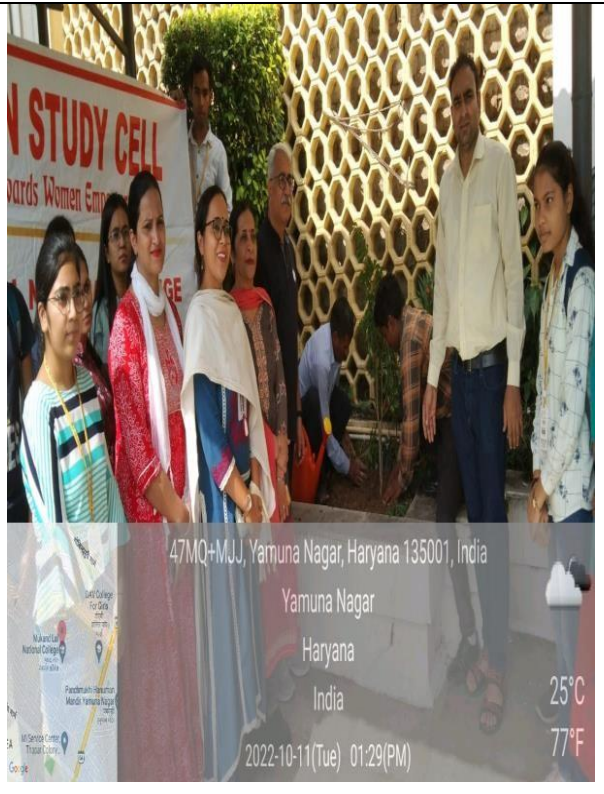
Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



Sr. No.	Common Name	Botanical or Family Name	Total Number
51.	Jamun	Eugenia jambolana	1
52.	Travelers Palm	Ravenala madagascariensis	2
53.	Scarlet jungle flame	Ixora coccinea	3
54.	Bael	Aegle marmelos	1
55.	Pine	Pinus roxburghii	1
56.	Agathis	Agathis Sp.	1
57.	Auri, Earleaf acacia, Northern black wattle	Acacia auriculiformis	1
58.	Retuse fig, Ficus Panda	Ficus retusa	2
59.	Bottle brush, Golden Topori	Callistemon lanceolatus	13
60.	Simbal	Bombax ceiba	1
61.	The Ashoka tree, SitaAshoka	Saraca asoca	1
62.	North Indian rosewood, Shisham	Dalbergia sissoo	1
63.	Croton	Codiaeum variegatum	8
64.	Erythrina, Coral tree	Erythrina	
65.	Putranjiva	Putranjiva roxburghii	1
66.	Raatki rani, Night Blooming Jasmine	Cestrum nocturnum	1
67.	Nolina palm, Ponytail Palm	Beaucarnea recurvata	2
68.	Pink poui, Rosy trumpet tree, Tabubia Pink	Tabebuia rosea	4
69.	Tabubia Yellow, Yellow Tabebuia, Golden Bell, Silver Trumpet Tree	Tabebuia argentea	4
70.	GoldenCupressus, Goldcrest	Cupressus macrocarpa	3
71.	Nag Champa, Michelia	Michelia alba	4
72.	Dracena (Vitoria)	Dracaena fragrans	4
73.	Song of India or Song of Jamaica	Dracaena reflexa	5
74.	Juniperus	Juniperus communis	4
75.	Indian soapberry, washnut, or ritha	Sapindus mukorossi	1
Total			572

College has **572 trees** in the campus. This is good initiative taken by management for green campus under the campaign of plantation. **It's APPRECIABLE.**

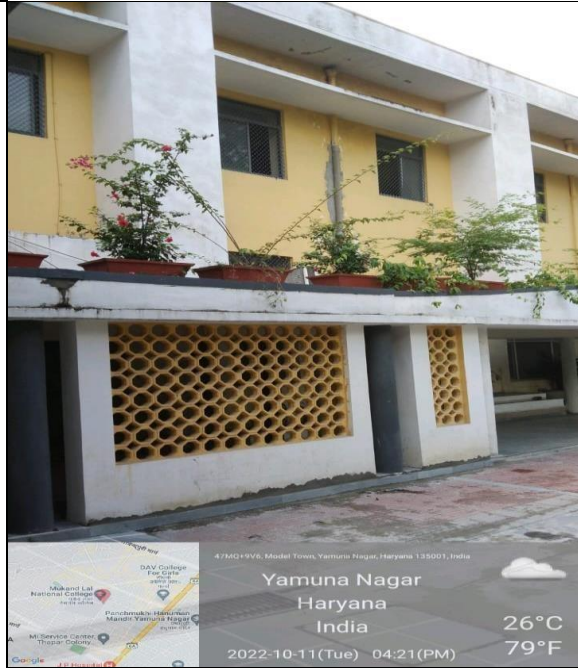
Some Plantation Photograph in college campus



Photos of Plantation in college campus



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



Plantation on the Roof



Botanical Garden



College Ground

CHAPTER- 3

RENEWABLE ENERGY AND SUSTAINABLE DEVELOPMENT

3.1 Grid Connected Solar Photovoltaic System (226kWp)

There is a 226 kWp solar photovoltaic rooftop grid-connected system on various building. The date of project installation is 14/12/2017. System details are given below:

Solar system on the commerce block -35 KWp

PV Panel	
Make	Adani
Panel Type	Poly-crystalline
Panel Wattage	340.79
Make	Satvik
Panel Type	Poly-crystalline
Panel Wattage	325
Invertor Information	
Make	Delta
Model	RPIM30A_121

Solar System on the Rooftop of Applied Physics, Botany, Zoology(75KW)

PV Panel	
Make	Himalayan
Panel Type	Poly-crystalline
Panel Wattage	330
Inverter Information	
Make	Ethos power
Model	15KW

Solar System on the Rooftop of Arts Block (50KW)

PV Panel	
Make	Havells
Panel Type	Poly-crystalline
Panel Wattage	330
Make	Adani
Panel Type	Poly-crystalline
Panel Wattage	340.79
Invertor Information	
Make	Havells
Model	15KW
Make	Delta
Model	RPIM30A_121

On the Rooftop of Basket Ball court (30KW)

PV Panel Detail	
Make	Satvik
Panel Type	Poly-crystalline
Panel Wattage	325
Inverter Information	
Make	Delta
Model	RPIM30A_121

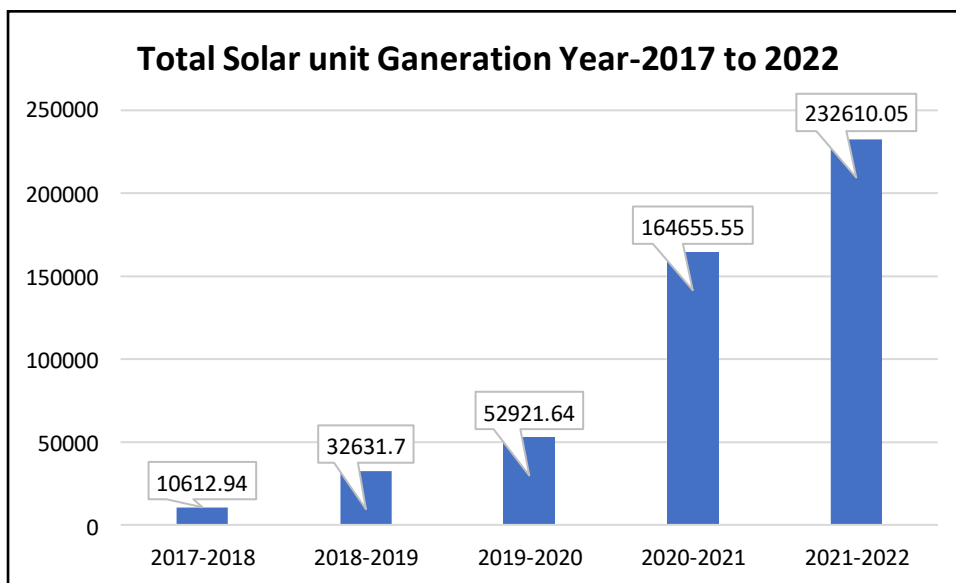
Photographs of Solar Plant:-



Figure 2.3:- Solar Plant and Inverter

Total Solar unit generation from installation.

Sr.No.	Year	Total Unit Generation
1	2017-2018	10,612.94
2	2018-2019	32,631.7
3	2019-2020	52,921.64
4	2020-2021	1,64,655.55
5	2021-2022	2,32,610.05
Total		4,93,431.88



Graphical presentation of Solar unit generation

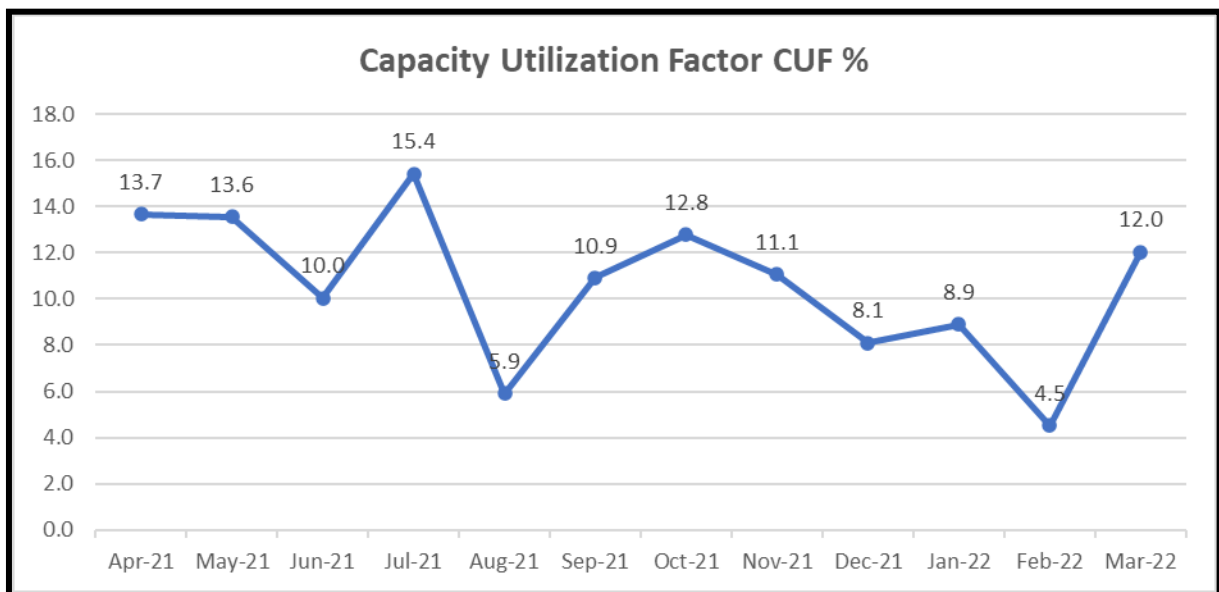
Observation: -

College has installed on grid solar system with capacity 226 KWp on various building .Total unit generation is 4,93,432 KWp units .**Its Appreciable**

Solar unit generation Year-2021-22 :-

Monthly Solar unit generation

Sr.No.	Month & Year	Solar Unit Generation	No of Days	CUF %
1	Apr-21	22,240	30	13.7
2	May-21	22,800	31	13.6
3	Jun-21	16,320	30	10.0
4	Jul-21	25,920	31	15.4
5	Aug-21	9,920	31	5.9
6	Sep-21	17,760	30	10.9
7	Oct-21	21,520	31	12.8
8	Nov-21	18,000	30	11.1
9	Dec-21	13,600	31	8.1
10	Jan-22	14,960	31	8.9
11	Feb-22	6,880	28	4.5
12	Mar-22	20,240	31	12.0
	Total	2,10,160	365	10.6



Observation :-

- ✚ It is observe that total solar unit generation is 2,10,160 units April-2021 to March-2022.
- ✚ Average Capacity utilization factor is 10.6 % It is low . It will be increased frequently to cleaning of the solar panel.

Chapter-04

Carbon Foot print

4.1 About Carbon Foot Print.

Climate change is one of the greatest challenges facing nations, governments, institutions, business and mankind today.

Carbon footprint is a measure of the impact of your activities have on the amount of carbon dioxide (CO₂) produced through the burning of fossil fuels and is expressed as a weight of CO₂ emissions produced in tonnes.

We focus on consumption in each of our five major categories: housing, travel, food, products and services. In addition to these we also estimate the share of national emissions over which we have little control, government purchases and capital investment.

For simplicity and clarity all our calculations follow one basic method. We multiply a use input by an emissions factor to calculate each footprint. All use inputs are per individual and include things like fuel use, distance, calorie consumption and expenditure. Working out your inputs is a matter of estimating them from your home, travel, diet and spending behavior.

Although working out our inputs can take some investigation on your part the much more challenging aspect of carbon calculations is estimating the appropriate emissions factor to use in your calculation. Where possible you want this emissions factor to account for as much of the relevant life cycle as possible.

We all have a carbon footprint...



4.2 Methodology and Scope

The carbon footprint gives a general overview of the college greenhouse gas emissions, converted into CO₂ -equivalents and it is based on reported data from internal and external systems. The purposes of the carbon indicators are to measure the carbon intensity per unit of product, in addition to showing environmental transparency towards external stakeholders. The carbon footprint reporting approach undertaken in this study follows the guidelines and principles set out in the “Greenhouse Gas Protocol Corporate Accounting and Reporting Standard” (hereafter referred to as the GHG Protocol) developed by the Greenhouse Gas Protocol Initiative and International Standard for the quantification and reporting of greenhouse gas emissions -ISO 14064. This is the most widely used and accepted methodology for conducting corporate carbon footprints. The study has assessed carbon emissions from the college campus. This involves accounting for, and reporting on, the GHG emissions from all those activities for which the college is directly responsible. The items quantified in this study are as classified under the ISO 14064 standards: The report calculates the greenhouse gas emissions from the college. This includes electricity, as well as emission associated with diesel consumption in the college vehicle. The emission associated with air travel, waste generation, administration, and marketing related activities has been excluded from the current study. Emissions from business activities are generally classified as scope 1, 2 or 3 areas classified under the ISO 14064 standards.

4.3 Carbon emission from Electricity

Direct emissions factors are widely published and show the amount of emissions produced by power stations in order to produce an average kilowatt-hour within that grid region.

Unlike with other energy sources the carbon intensity of electricity varies greatly depending on how it is produced and transmitted. For most of us, the electricity we use comes from the grid and is produced from a wide variety of sources. Although working out the carbon intensity of this mix is difficult, most of the work is generally done for us.

Electricity used in the site is the significant contributors towards GHGs emission from the unit. Electricity used onsite is the most direct, and typically the most significant, a contributor to a unit's carbon footprint. Thus, using an average fuel mix of generating electricity, carbon dioxide intensity of electricity for national grid is assumed to be 0.9613 KgCO₂/ Kwh

Sr.No.	Year	Total Unit Consumption	Unit	Emission Factor kg CO ₂ e/kWh	Emission ton CO ₂ e/ year
1	2021-22	218093	KWH	0.9613	209.652

4.4 Carbon emission from DG sets: -

College has 03 no DG sets installed on the campus.

Total diesel consumption in a year in the table: -

Sr .No.	Month & Year	Total Diesel Consumption (Litre)
1	Apr-21	123
2	May-21	80
3	Jun-21	217
4	Jul-21	150
5	Aug-21	129
6	Sep-21	120
7	Oct-21	170
8	Nov-21	158
9	Dec-21	100
10	Jan-22	129
11	Feb-22	160
12	Mar-22	109
Total		1645

Every litre of diesel fuel contains 720 grams of pure carbon. It is average of liquid hydrocarbon burning engine. It can be assumed that about 99 % of the fuel is oxidized. It is assumed that somewhat less than 01 % will fail to fully oxidize and will be emitted as a particulate of unburned hydrocarbons instead of CO₂.

Calculation of Total CO₂ =

- ❖ CO₂ Emissions from a litre of diesel: 2689.56 grams CO₂/ litre
- ❖ Diesel consumption April-2021 to March-2022 = 1645 litre
- ❖ 1645 x 2689 = 4423405 gram. or 4.42 **Ton/year**

4.5 Biomass Calculation and CO₂ Sequestration of the Trees: -

1. Estimation of above-ground biomass (AGB)

$$K = 34.4703 - 8.0671D + 0.6589 D^2$$

Where = K is above-ground biomass.

D is Breast height diameter in (cm)

- 1 Estimation of below ground biomass (BGB)

$$BGB = AGB \times 0.15$$

- 2 Total Biomass (TB)

$$TB = AGB + BGB$$

- 3 Calculation of carbon dioxide Weight sequestered in the tree in Kg.

$$C = W \times 0.50$$

- 4 Calculate the weight of CO₂ sequestered in the tree per year in Kg.

$$CO_2 = C \times 3.666$$

Where: -

AGB = Above ground biomass.

D = Diameter of tree breast height.

BGB = Below Ground Biomass.

C = Carbon

TB = Total Biomass.

Biomass Calculation of tree

Sr. no	Common Name	Average Breast Diameter CM (25 to 50)	AGB	BGB	Total	Carbon Storage	Amount of CO ₂ Sequestered	No of Tree	Total Amount of CO ₂ Sequestered	Annually CO ₂ Sequestered amount Ton/year
1	The Cuban royal palm or Florida royal palm	12	35	5	41	20	75	70	5228	0.07
2	Weeping Fig, Ficus sp. (Green Ficus /Black Ficus /Starlight)	20	145	22	166	83	305	230	70150	0.96
3	Pinwheel flower, Crape jasmine	23	208	31	239	120	439	6	2632	0.04
4	Oleander	25	257	39	296	148	542	5	2710	0.04
5	Areca palm or cane palm, areca palm, yellow palm, butterfly palm, or bamboo palm	30	403	61	464	232	850	13	11056	0.15
6	Crape myrtle or Giant crepe-myrtle	20	145	22	166	83	305	1	305	0.00
7	Juniperous orJuniper	27	312	47	358	179	657	7	4598	0.06
8	Mango	45	1046	157	1203	602	2205	15	33081	0.45
9	Casuarina	23	208	31	239	120	439	4	1754	0.02



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



10	The Asian bayberry	25	257	39	296	148	542	1	542	0.01
11	Chukrasia or The Indian mahogany	25	257	39	296	148	542	1	542	0.01
12	Powderpuff	35	584	88	671	336	1231	3	3692	0.05
13	The bayur tree or karnikara tree	23	208	31	239	120	439	4	1754	0.02
14	Kachnar	35	584	88	671	336	1231	1	1231	0.02
15	Teak	20	145	22	166	83	305	1	305	0.00
16	Kadamba, Burflower-tree	30	403	61	464	232	850	1	850	0.01
17	China rose	23	208	31	239	120	439	12	5263	0.07
18	Camphor or Kapur	40	798	120	918	459	1682	2	3364	0.05
19	Yellow oleander	35	584	88	671	336	1231	8	9845	0.13
20	Amaltas, Golden tree	30	403	61	464	232	850	3	2551	0.03
21	Thuga	35	584	88	671	336	1231	1	1231	0.02
22	Peregrina, Jatropha	35	584	88	671	336	1231	3	3692	0.05
23	Gulmohar Tree	23	208	31	239	120	439	5	2193	0.03



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



24	Parijatak Plant, Harsringar	40	798	120	918	459	1682	2	3364	0.05
25	Plumeria, Frangipani	35	584	88	671	336	1231	39	47992	0.65
26	Blackboard tree, Scholar Tree, Milkwood or devil's tree	36	624	94	717	359	1315	13	17097	0.23
27	Pepal	30	403	61	464	232	850	2	1701	0.02
28	Silk oak or silky oak, silver oak	27	312	47	358	179	657	2	1314	0.02
29	Albizia	28	341	51	392	196	718	2	1437	0.02
30	The tree jasmine or Indian cork tree	30	403	61	464	232	850	1	850	0.01
31	Lemon	20	145	22	166	83	305	2	610	0.01
32	Rudraksha tree	45	1046	157	1203	602	2205	1	2205	0.03
33	Neem	37	665	100	765	383	1403	5	7013	0.10
34	Norfolk Island pine	23	208	31	239	120	439	2	877	0.01
35	Curry Leaf Tree	30	403	61	464	232	850	1	850	0.01
36	Yellow bells	26	284	43	326	163	598	6	3588	0.05



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



37	Banyan tree	30	403	61	464	232	850	1	850	0.01
38	Magnolia, Champa	25	257	39	296	148	542	5	2710	0.04
39	Fan Palm	30	403	61	464	232	850	9	7654	0.10
40	Mulberry	30	403	61	464	232	850	1	850	0.01
41	Mahua	25	257	39	296	148	542	1	542	0.01
42	Nagkesar	30	403	61	464	232	850	1	850	0.01
43	Arjun	33	508	76	584	292	1070	1	1070	0.01
44	Jack Fruit Tree	28	341	51	392	196	718	1	718	0.01
45	Amla	35	584	88	671	336	1231	1	1231	0.02
46	Teak	36	624	94	717	359	1315	1	1315	0.02
47	Cinnamon, Dalchini	39	752	113	865	433	1586	2	3172	0.04
48	Horseradish tree or Drumstick tree	36	624	94	717	359	1315	2	2630	0.04
49	Allspice or Jamaica pepper	35	584	88	671	336	1231	1	1231	0.02
50	Jacaranda	28	341	51	392	196	718	1	718	0.01
51	Jamun	35	584	88	671	336	1231	1	1231	0.02



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22





52	Travelers Palm	40	798	120	918	459	1682	2	3364	0.05
53	Scarlet jungle flame	25	257	39	296	148	542	3	1626	0.02
54	Bael	35	584	88	671	336	1231	1	1231	0.02
55	Pine	45	1046	157	1203	602	2205	1	2205	0.03
56	Agathis	30	403	61	464	232	850	1	850	0.01
57	Auri, Earleaf acacia, Northern black wattle	40	798	120	918	459	1682	1	1682	0.02
58	Retuse fig, Ficus Panda	30	403	61	464	232	850	2	1701	0.02
59	Bottle brush, Golden Topori	35	584	88	671	336	1231	13	15997	0.22
60	Simbal	37	665	100	765	383	1403	1	1403	0.02
61	The Ashoka tree, SitaAshoka	30	403	61	464	232	850	1	850	0.01
62	North Indian rosewood, Shisham	35	584	88	671	336	1231	1	1231	0.02
63	Croton	32	472	71	542	271	994	8	7952	0.11
64	Erythrina, Coral tree	35	584	88	671	336	1231		0	0.00
65	Putranjiva	25	257	39	296	148	542	1	542	0.01



Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



66	Raatki rani, Night Blooming Jasmine	25	257	39	296	148	542	1	542	0.01
67	Nolina palm, Ponytail Palm	34	545	82	627	313	1149	2	2298	0.03
68	Pink poui, Rosy trumpet tree, Tabubia Pink	35	584	88	671	336	1231	4	4922	0.07
69	Tabubia Yellow, Yellow Tabebuia, Golden Bell, Silver Trumpet Tree	30	403	61	464	232	850	4	3402	0.05
70	GoldenCupressus, Goldcrest	20	145	22	166	83	305	3	915	0.01
71	Nag Champa, Michelia	30	403	61	464	232	850	4	3402	0.05
72	Dracena (Vitoria)	30	403	61	464	232	850	4	3402	0.05
73	Song of India or Song of Jamaica	30	403	61	464	232	850	5	4252	0.06

	Green Audit Report Mukand Lal National College Yamuna Nagar , Haryana 2021-22	
---	--	---

74	Juniperus	40	798	120	918	459	1682	4	6729	0.09
75	Indian soapberry, washnut, or ritha	40	798	120	918	459	1682	1	1682	0.02
Total								572	356424	4.86

College has **572 trees** in the campus. This is good initiative taken by management for green campus under the campaign of plantation. **It's APPRECIABLE.**

There is total CO₂ sequestered **4.86 Tons /Year**. There are requirements of more plantations to reduce carbon emission share by college

Carbon neutralized by solar

Grid Connected Solar Photovoltaic System (226 KWp)

There is a 226 KWp solar photovoltaic rooftop grid-connected system on various building. Due to solar total CO₂ neutralized by the solar is given table

Sr.No.	Year	Total Unit Generation	Unit	Emission Factor kg CO ₂ e/kWh	Emission ton CO ₂ e/ year
1	2021-22	210160	KWp	0.9613	202.02

Total CO₂ Emission by the college

Sr. NO	CO ₂ Emission by	Total CO ₂ Emission
1	Electricity	202.02
2	DG sets	4.42
Total CO₂ Emission		206.44
CO ₂ Emission Neutralized by		
1	Trees	4.86
2	Solar	202.02
Total CO₂ Emission Neutralized		206.88

Other Emissions Excluded

This study did not evaluate the carbon sequestration potential of existing from the staff commuting, food supply, official flights, paper products, water supply, and waste disposal and recycling due to limited data availability. The current study identifies areas where data monitoring, recording and archiving need to be developed for enlarging the scope of mapping of GHGs emission in the future years. Accordingly, a set of tools and record keeping procedure will be developed for improving the quality of data collection for the next year carbon footprint studies.

CHAPTER- 5

WASTE MANAGEMENT

5.1 About Waste:

Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health. Waste management is important for an eco-friendly campus. In college different types of wastes are generated, its collection and management are very challenging.

Solid waste can be divided into three categories: bio-degradable, non-biodegradable and hazardous waste. A bio-degradable waste includes food wastes, canteen waste, wastes from toilets etc. Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles etc. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals, acids and petrol.

Unscientific management of these wastes such as dumping in pits or burning them may cause harmful discharge of contaminants into soil and water supplies, and produce greenhouse gases contributing to global climate change respectively. Special attention should be given to the handling and management of hazardous waste generated in the college. Bio-degradable waste can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-biodegradable waste can be utilized through recycling and reuse. Thus, the minimization of solid waste is essential to a sustainable college. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems.

Table 5.1 Different types of waste generated in the college campus.

Sr.No.	Types of Waste	Particulars
1	Solid wastes	Damaged furniture, paper waste, paper plates, food wastes etc.
2	Plastic waste	Pen, Refill, Plastic water bottles and other plastic containers, wrappers etc.
3	E-Waste	Computers, electrical and electronic parts etc.
4	Glass waste	Broken glass wares from the labs etc.
5	Chemical wastes	Laboratory waste etc.
6	Bio-medical Waste	Sanitary Napkin etc.

5.2 Waste management practices adopted by the college

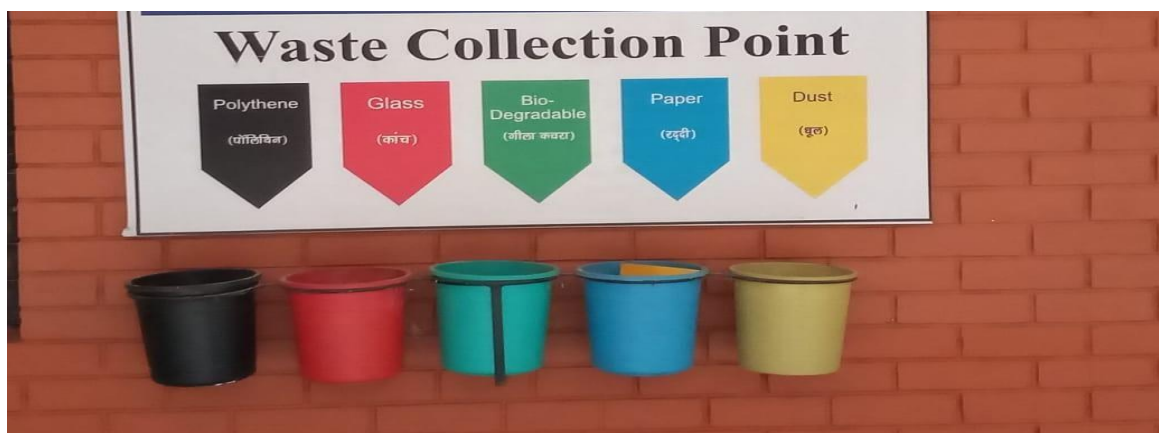
College has a different type of waste generated like paper, Plastic, dust and wet waste. The college provided dustbin near classroom office, laboratories staffroom and collect the waste material at the end of the day. The waste (Especially dry material) is collected in a big dustbin which is provided at every floor and the next day collected municipal corporation for further processing.



Figure 5.2 Waste collection bin in college campus

Recommendation

It is recommended to adopted 5 Bin Waste Collection System to collect different type of waste generated in college premises.



Recommended 5 Dust Bin waste collection System

5.3Waste Collection Points:

Audit team also visited various departments, canteen, and residential area, to find out waste generation area and waste collection points for further improvement. Details are given in the table

Detailed of Waste collection Dust bin system

Sr .no	Location	No of Bin
1	Arts Dept,	3
2	Science Dept.	2
3	Commerce	2
4	Library	3
5	Admin Office	4
6	Physics Lab	2
7	Chemistry Lab	3
8	Computer Lab	8
9	Basket Ball Court	1
10	Common Office	4
11	Central Office	2
12	Others	6
	Total	40




Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22



5.4 E-waste management :

College has dispose all type of E – waste by third party vender. **Its appreciable**

Details are given in table .

 **HARYANA STATE POLLUTION CONTROL BOARD**
SCO-131 Sector-17, HUDA Jagadhari Ph.01732-200137 Email:- hspcbroyr@gmail.com
E-mail: hspcb@hry.nic.in

2022

No. HSPCB/Consent/ : 329994522YAMCTO18558932 Dated:06/01/2022

To.

M/s :Goverdhan steel
Tirth Nagar badimazra yamuna nagar

Subject: Grant of consent to operate to M/s Goverdhan steel.

Please refer to your application no. 18558932 received on dated 2021-12-05 in regional office Yamuna Nagar. With reference to your above application for consent to operate, M/s Goverdhan steel is here by granted consent as per following specification/Terms and conditions.

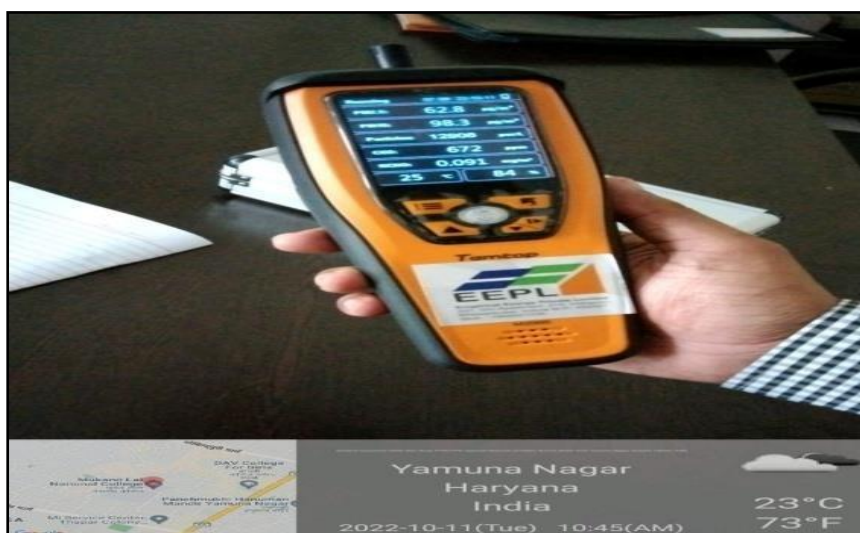
Consent Under	BOTH
Period of consent	06/01/2022 - 31/03/2026
Industry Type	Dismantling of E-waste
Category	ORANGE
Investment(In Lakh)	16.610001
Total Land Area(Sq. meter)	1280.0
Total Builtup Area(Sq. meter)	610.0
Quantity of effluent	
1. Trade	0.0 KL/Day
2. Domestic	1.0 KL/Day
Number of outlets	1.0
Mode of discharge	
1. Domestic	septic tank
2. Trade	
Domestic Effluent Parameters	
1. NA	
Trade Effluent Parameters	
1. NA	
Number of stacks	1
Height of stack	
1. attached to suction hood	12.6 M
Emission parameters	
1. SPM	150 mg/m ³
Product Details	
1. E waste items	2 Metric Tonnes/day

CHAPTER- 6

Air Quality Measurement

Environment audit team was conducted air monitoring survey in college campus . Details are given in table

Sr.No.	Location	PM2.5	PM10	CO ₂	HCHO
1	Principal Office	39	63	747	0.098
2	Administration Office	42.1	66.4	739	0.143
3	IQAC Office	103	166.2	976	0.138
4	Staff Room	71	110	656	0.104
5	Chemistry Department	74.4	114.6	659	0.102
6	Class rooms	71.8	111.1	705	0.102
7	Sport Block	73.8	117.1	678	0.103
8	Botany Department	33.5	53.1	614	0.121



Observation:-

- ✚ It is observe that CO₂ level higher is side in IQAC office and chemistry department. It is recommended to required proper ventilation and indoor plants.
- ✚ It is recommended to conducted air monitoring survey every six month in college.

CHAPTER- 7 RECOMMENDATIONS AND SUGGESTIONS

7.1 QR Code System

While the world seems to be going digital, people lack the time to read books and process the information they contain. hence, college can be provided QR codes on the trees for its information and to exploit the rapidly growing platform for a unique purpose.



Fig: 7.1 QR Code System for plants

These codes can give students all the information they need to know about the tree — from its scientific name to its medicinal value. They only need to put their smart-phones to use. QR codes to them, making it easier for everybody to learn about a plant or a tree at the tip of their fingers,” If any app generating a QR code, which is available for free on the online stores, can be used to avail the information of the trees.

7.2 Other Suggestions

Some of the very important suggestions are: -

- ✚ Adopt the proposed environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
- ✚ Increase recycling education on campus.
- ✚ Increase awareness of environmentally sustainable development in college campus.
- ✚ Practice institutional ecology- set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
- ✚ Involve all stakeholders- encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development.
- ✚ Collaborate for interdisciplinary approaches- To develop interdisciplinary approaches to curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- ✚ Increase reduces, reuse, and recycle education on campus.
- ✚ Develop a butterfly garden that arouses appreciation towards flora and fauna diversity.
- ✚ Name all the trees and plants (Plant, barcodes) with its common name and scientific name.
- ✚ Arrange training programmes on environmental management system and nature conservation.
- ✚ Renovation of cooking system in the canteen to save gas by installation solar water heater system with heat pump.
- ✚ Establish a procurement policy that is energy saving and eco-friendly.



**Green Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22**



**END OF THE REPORT
THANKS**