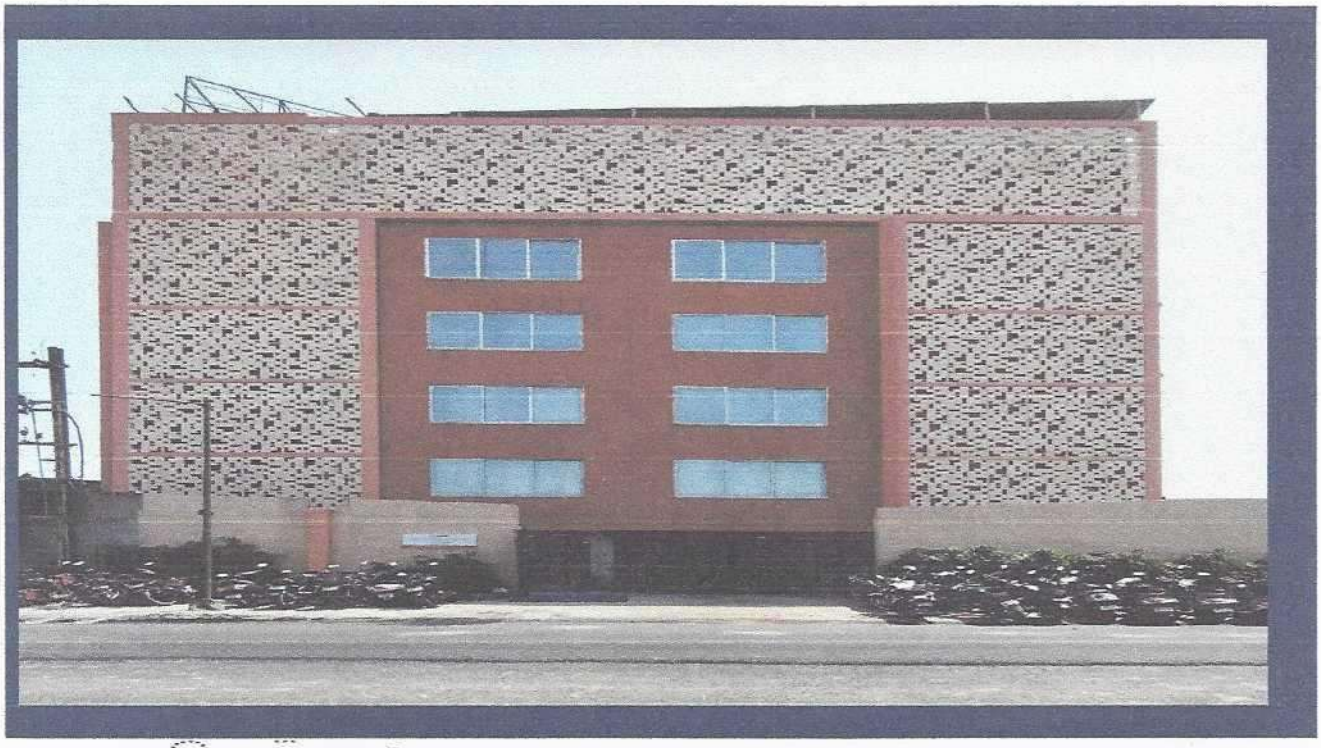

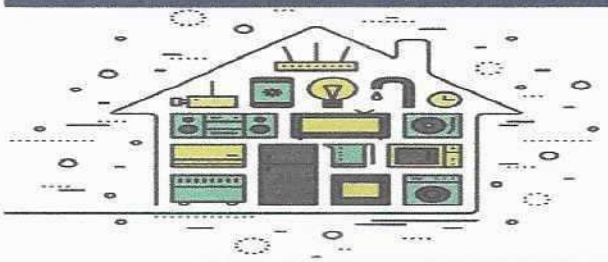

Energy Audit

ENERGY AUDIT REPORT

2022-23

PREPARED BY
GREEN INDIA MISSION, PATNA
IN ASSOCIATION WITH AYAN ENTERPRISES, PATNA

GREEN INDIA MISSION ESTD.-2017 PATNA (BIHAR)

Catalyst College

(A Unit of Vijayam Education, Patna, Bihar)
Affiliated to Patliputra University, Patna Bihar

Email : info@catalystcollege.in Contact No.9835024444
Logon : www.catalystcollege.in
Address : PLOT NO. C16(P), INFRONT OF COCA COLA, PATLIPUTRA INDUSTRIAL AREA, PATNA - 800013, BIHAR

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14.03.2023

Dr. Arvind Kumar Singh
BEE & BIS Certified Auditor
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14/03/2023
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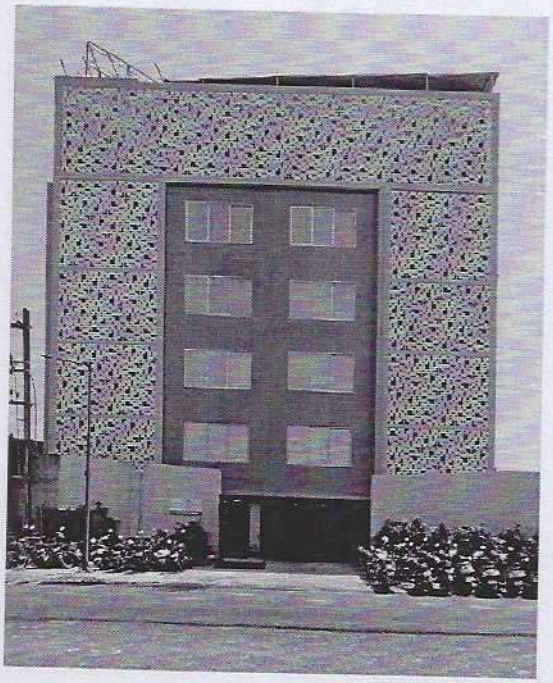
ABBREVIATION

A	Amps
AC	Air Conditioner
AC	Alternating Current
AMET	Academy of Maritime Education and Training
CFL	Compact fluorescent lamp
CIP	Comprehensive Inspection Programme
DC	Direct Current
HSD	High Speed Diesel
Hz	Hertz
kg	Kilogram
kVA	kilo-volt-ampere
kW	kilo Watts
kWh	kilowatt hour
kWp	Kilowatt peak
LED	Light Emitting Diode
LPG	Liquefied Petroleum Gas
MMS	Module mounting structure
MPPT	Maximum Power Point Tracker
NAAC	The National Assessment and Accreditation Council
SEC	Specific Energy Consumption
SPV	Solar Photovoltaic
STC	Standard Test Condition
TV	Television
V	Volts
W	Watts
W/m2	watt per square metre

OVERVIEW OF THE COLLEGE

Catalyst College is a permanently affiliated to Patliputra University, Patna. It was established in the year 2013. The college possesses a campus of 1.07 acre with a student strength of 349 and 48 strong core faculty members along with visiting / guest faculties along with guest faculties located in the urban area of Patliputra Industrial Area, Patna, Catalyst College was born out of a vision to address the critical need for qualified educators and to provide a platform for quality education. The founders envisioned an institution that would not only impart academic knowledge but also instill values of social responsibility, ethical conduct, and community service among its students.



As an institution of learning it has a commanding presence both in the University as well as in the capital of the state while maintaining its exemplary record in University examinations.

MISSION

Our mission is to adapt to the evolving needs of society by focusing on the following key aims:

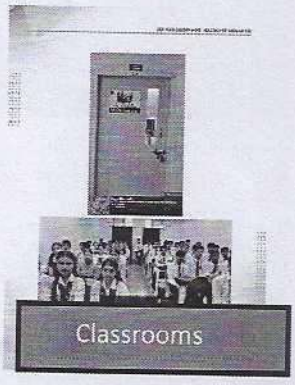
1. **Skill Development**: We are committed to enhancing the skills of unskilled and semi-skilled individuals, school and college dropouts, and underprivileged members of society. Through industrial training and a robust curriculum, we aim to enable them to achieve high performance.
2. **Empowerment of Underprivileged Communities**: Our focus is on providing affordable vocational education to weaker sections of society, particularly in the backward regions of eastern India. By implementing sound business and management practices, we aim to help individuals earn a sustainable livelihood, contributing to poverty alleviation.
3. **Optimization of Human Potential**: We strive to unlock the potential of people in eastern India, particularly in rural and semi-rural areas. By offering superior training solutions, we enhance their engagement in various vocations, fostering happiness and prosperity.
4. **Compassionate Vocational Training**: We actively serve the community by providing high-quality, compassionate livelihood training. Our goal is to make human resources more productive and proactive, empowering individuals to contribute meaningfully to society.
5. **Youth Empowerment**: We focus on preparing youth to become productive adults through entrepreneurship development, technology innovation, and skill education. By equipping them with essential knowledge and skills, we aim to improve their quality of life and that of their families and communities.

VISION

Our vision is to maintain an unwavering commitment to the highest quality standards in education, continuously illuminating society with knowledge and innovation. In pursuit of this vision, we are dedicated to:

1. **Value-Based Education**: We strive to develop and promote a professional educational system grounded in strong values, fostering innovation at every level.
2. Knowledge Advancement: We are committed to keeping pace with the ever-expanding frontiers of knowledge, making significant contributions to the growth of an intellectually vibrant society through pioneering educational initiatives
3. Inspirational Leadership: As a value-based organization, we aim to inspire leadership and satisfy intellectual curiosity. We embrace a progressive ethos rooted in humanistic traditions, community involvement, accountability, integrity, and respect for all.

By embodying these principles, we stand on the threshold of substantial growth, driven by our continuous commitment to excellence and our proven ability to deliver the best in education. Through this vision, we aspire to empower individuals and communities, shaping a brighter future for all.



AUDIT PARTICIPANTS

On behalf of College Administration

Name	Designation
Mr. Neeraj Agrawal	*Principal*
Mr. Amit Shukla	*IQAC Coordinator*
Dr.Pawan Kumar Jha	*Member*
Dr.Neeraj Poddar	*Member*
Dr.Reena Prasad	*Member*
Ravi Kumar Soni	*Member*
Nitish Rohitgi	*Member*

On behalf of Green India Mission

Name	Position	Qualifications
Dr.Arvind Kumar Singh	**BEE & BIS Certified Auditor**	*Ph.D.,MSc.(Environment & Management)*
Dr. Mirza H. Abbas	**Co-Auditor**	M.Sc(Physics), Field Expert

EXECUTIVE SUMMARY

The purpose of this Energy Audit was to seek opportunities to improve the energy efficiency of the Catalyst College . Reducing the energy consumption despite improving the human comfort, health and safety were of primary concern.

Beyond just identifying the energy consumption pattern, this audit sought to detect and categorize the most energy efficient appliances. Additionally, some daily practices relating common appliances have been shared which may help reducing the energy consumption. Data collection for energy audit of the campus was carried out by the AYAN ENTERPRISES Team. The Energy Audit Report accounts for the energy consumption patterns of the institution on actual survey and detailed analysis during the audit.

The work comprehends the area wise consumption computed using suitable equipment. The analysis was carried out by our team with the support of the staff members from Catalyst College.The report provides a list of possible actions to preserve and efficiently access the available source, resources and their saving potential was also identified. We look forward towards optimization

that the authorities, students and staff members would follow the recommendations in the best possible way. The report is based on certain generalizations including the approximations wherever necessary. The views conveyed may not reveal the general opinion. They merely represent the opinion of the team guided by the interviews of clients. We are happy to submit this Energy audit report to the Catalyst College.

ENERGY AUDIT - ANALYSIS

1. ENERGY CONSUMPTION

To understand the Energy Consumption trends and to analyze the average monthly consumption we have collected electricity energy bills from July 2022 to June 2023

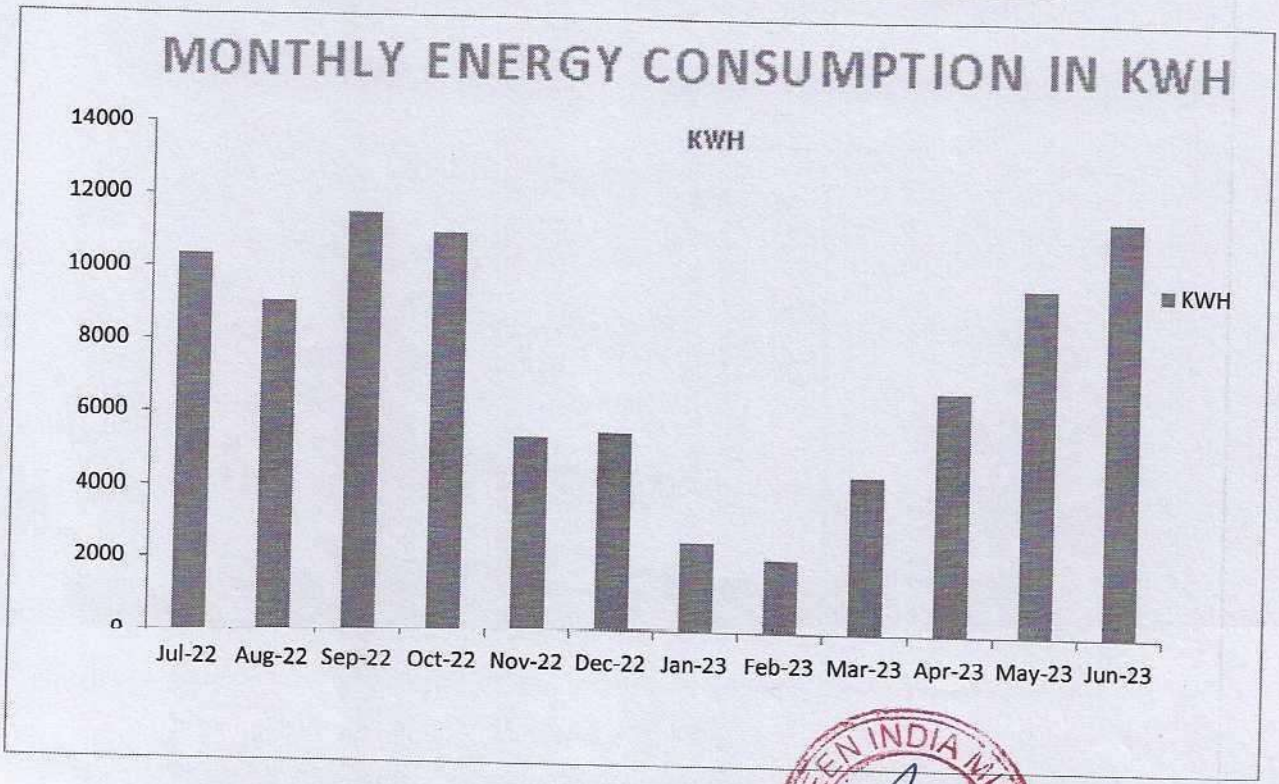
The details of **"Meter Connection"** at **"Catalyst College"** are as follows-

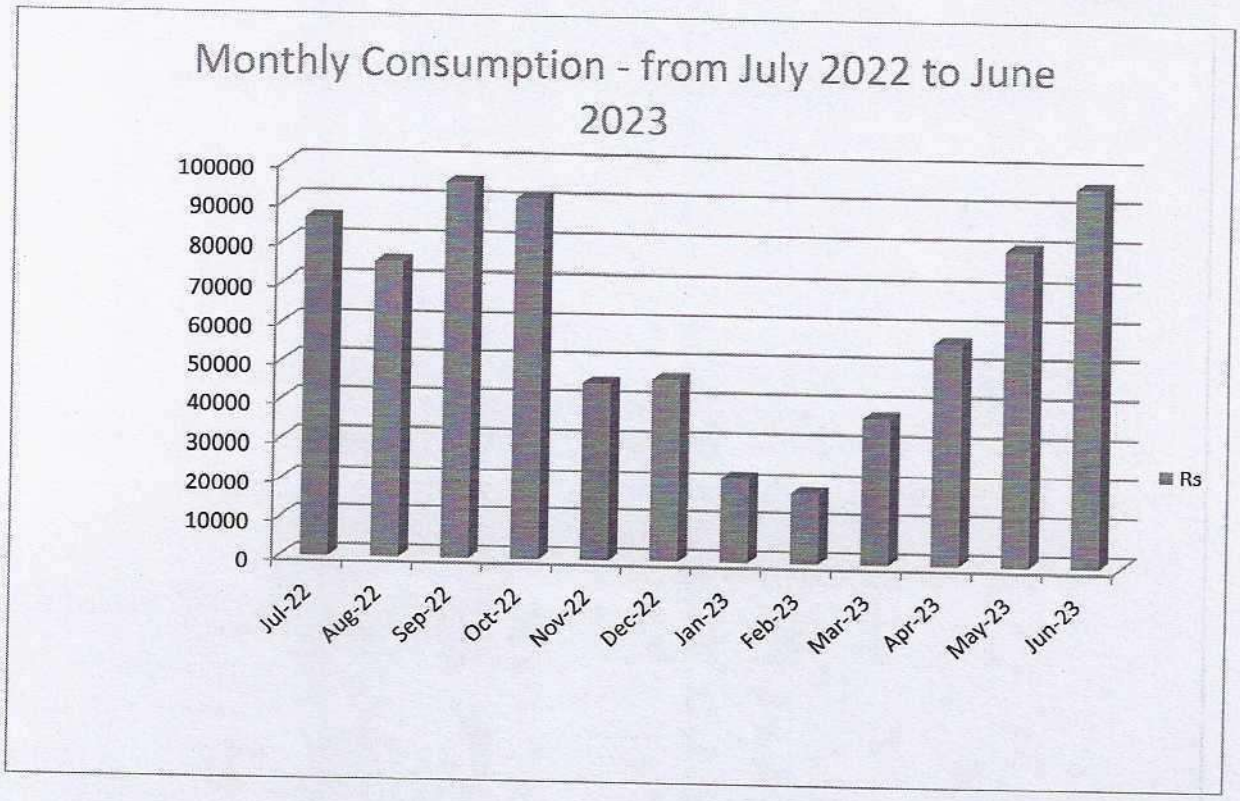
Name	-	SRI VIJAYAM EDUCATIONALS TRUST
CA No.	-	102381540

1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

To understand the Energy consumption trend and to develop the baseline parameter we have collected monthly energy bills for the 12 months i.e. from July 2022 to June 2023.

Month	Solar PV	CA No. 102381540 Total Readings	Rate INR	Amount in INR
Jul-22	5000	10370	8.30	86071
Aug-22	5000	9084	8.30	75397.2
Sep-22	5000	11511	8.30	95541.3
Oct-22	5000	11024	8.30	91499.2
Nov-22	5000	5445	8.30	45193.5
Dec-22	5000	5596	8.30	46446.8
Jan-23	5000	2645	8.30	21953.5
Feb-23	5000	2190	8.30	18177
Mar-23	5000	4514	8.30	37466.2
Apr-23	5000	6847	8.30	56830.1
May-23	5000	9694	8.30	80460.2
Jun-23	5000	11588	8.30	96180.4
Total	**60000**	**90508**		**751216.4**





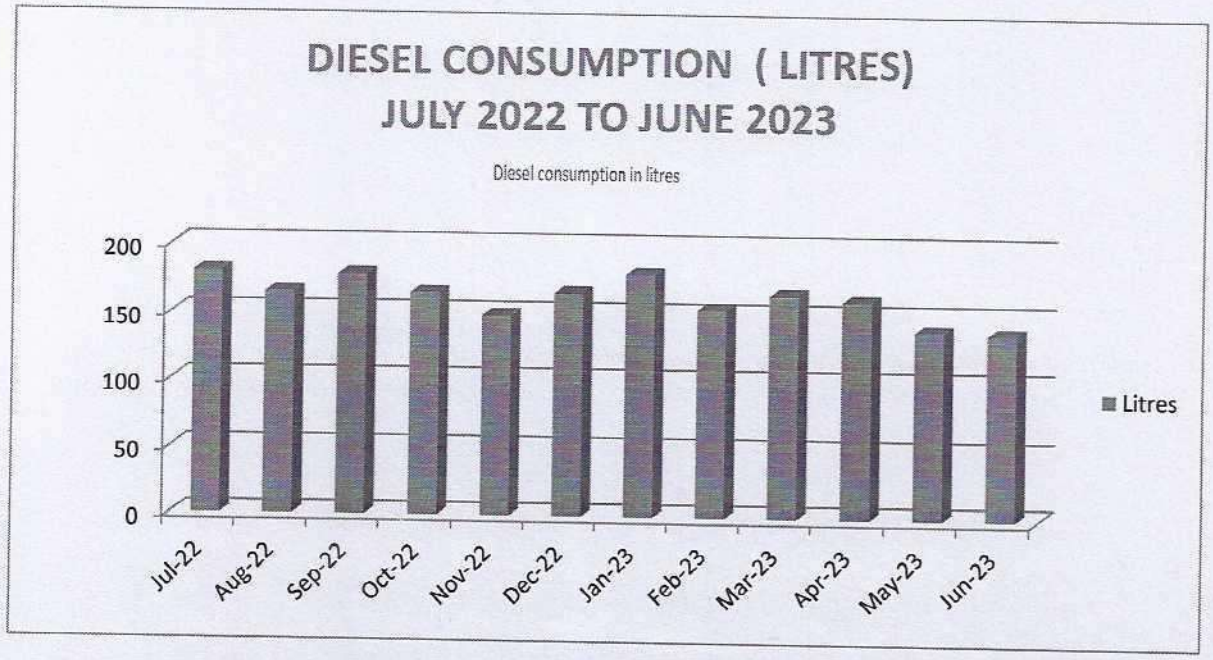
	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Rs	**86071**	**75397.2**	**95541.3**	**91499.2**	**45193.5**	**46446.8**	**21953.5**	**18177**	**37466.2**	**56830.1**	**80460.2**	**96180.4**

2. DIESEL CONSUMPTION

Below is the diesel consumption details in liters from July 2022 to June 2023.

Period	Diesel consumption (in liters)
Jul-22	180
Aug-22	165
Sep-22	178
Oct-22	165
Nov-22	149
Dec-22	166
Jan-23	180
Feb-23	155
Mar-23	166
Apr-23	162
May-23	140
Jun-23	138
Total	1944

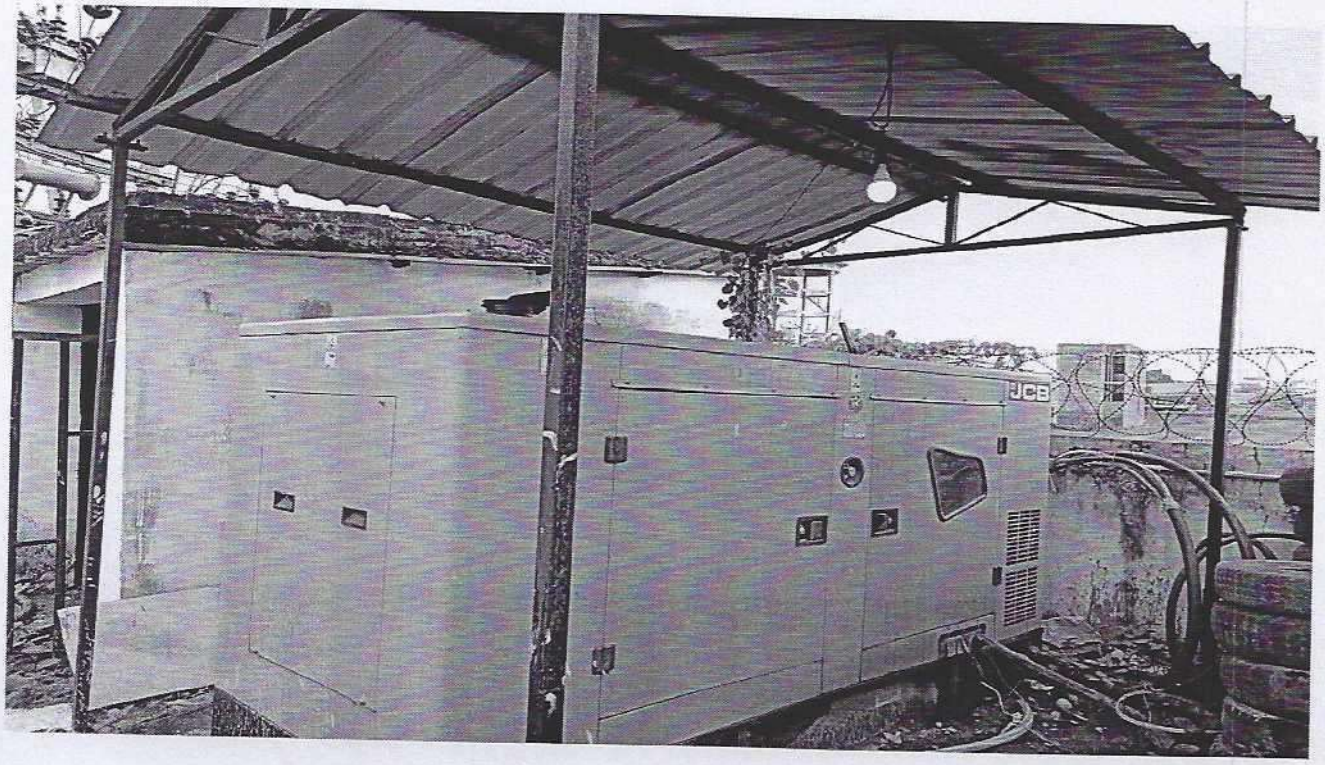
Note: College doesn't have records of monthly diesel consumption, so average value has been taken based on college's representative suggestion



3. ANALYSIS OF DG SETS

In the campus, there are one Diesel Generator (DG) set for its electrical power needs in caseof Grid power failure. DG set capacity is 62.5 kVA.

DG Set Design Details		
Description	*Unit*	*DG at Station*
Rated capacity	kVA	62.5
Hz		50
Sl No.		4R1040-T
Make		Kirloskar
Rated Power	kW	62
PF		0.8 Cos f
Phase		03
Noise Limit		75 db
Amps	Amps	87.5
Mfg.		2007



DG Set Operation details		
Operating hours during testing	Hours	0.50
% Loading	%	66.54
Energy Generation	kWh	33.86
Load	kVA	93.65
Fuel consumption during testing	Litre	06
Specific energy generation	kWh/litre	3.17

Observation and Suggestions:-

Soundproof silent generators are an efficient tool to keep both noise and vibration at low levels. For this purpose the power backup of the institution, the soundproof model is installed.

As per the trial taken during the energy audit the percentage loading of DG set is 66.54% which is ok and specific energy consumption of DG Sets 3.17 kWh/Litre which is satisfactory because as per manufacturer recommendation, best practices for SEC in DG sets range from 3.0 to 3.5 kWh/Litre and above.

We recommend college to initiate periodic maintenance schedule and monitoring of DG set through authorized lab.

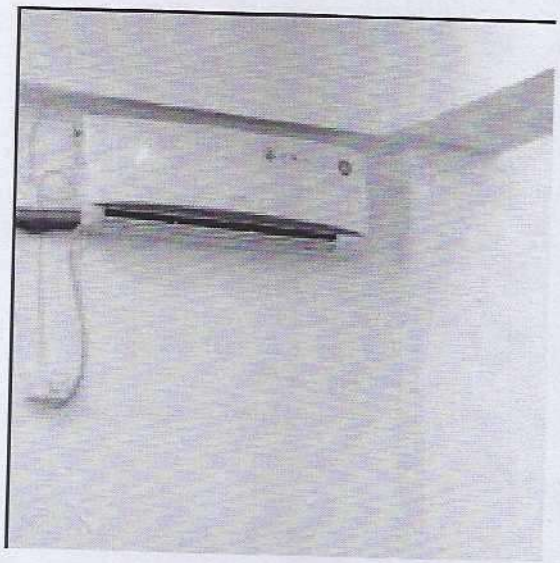
4. AC SYSTEM

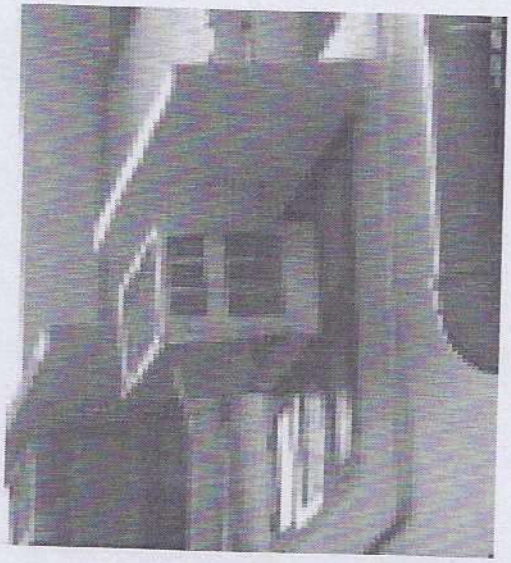
Energy Efficiency Ratio (EER): Performance of smaller chillers and ground floor units is frequently measured in EER rather than kW/ton. EER is calculated by dividing a chiller's cooling capacity (in Btu/h) by its power input (in watts) at full-load conditions.

There are 03 ACs installed in Catalyst College in various areas of various capacity the detail is given below:-

Location	Number of AC
Principal chamber	01
Staff room	02
Administrative Block Ground	01
Total	**04**

Remarks: - We have checked Energy Efficiency Ratio of AC's and EER of AC's is fairly OK. But in future you should purchase 3-Star rated inverter based split AC's because power consumption of Inverter based BEE 3-Star rated AC's is less than non-star rated AC's.





We recommend Catalyst College to organize periodic maintenance schedule and take corrective actions for insulating of AC's refrigerant lines in order to protect energy losses.

5. FANS ANALYSIS

In the Catalyst College, there are 106 fans installed. The observation and suggestionare given below.

Fans wattage	Count
Ceiling Fan-	106
Bulb Led	339
Tube light	94
Total	**539**

Observation and Suggestions:-

In the college, all the ceiling fans are of 60 W but BEE 5 Star Rated of 30W Ceiling Fans are present in the market. We recommend replacement to BEE 5 Star rated 30W fans.

Note:- Energy saving will increase or decrease if operating hours of machine /equipment will be increased or decreased and payback period will also increase or decrease if cost of investment (Cost of machine/equipment/accessories of machine) will increase or decrease because cost of investment is taken on tentative basis.

Lights type (based on wattage)	Count
18W LED Light	60
12 W LED Round	25
36W LED	100
36W Tube light	90
Total	**275**

Lux Measurement

Description	Lux	Remark
Class Rooms	120 to 235	Acceptable
Offices	130 to 240	Acceptable
Corridors	35 to 90	Acceptable
Washrooms	45 to 76	Acceptable
Outdoor	36 to 95	Acceptable
Computer Lab	150 to 289	Acceptable
Parking area	45 to 94	Acceptable
Canteen	69 to 185	Acceptable

Observation

College has initiated LED based lighting solution, but still there are 100 (36W) tube lights. LEDs save energy, the life span is much greater and emit virtually no heat. We recommend to replace the tube lights with LEDs.

Additionally, we recommend to install motion sensor-based lights in common areas such as library, washrooms, corridors, etc.

We also recommend to use solar lights for open areas like parking, ground, street lights, etc. Table below shows the performance characteristics comparison of all luminaries.

Table - Luminous Performance Characteristics of Commonly Used Luminaries

Type of Lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life
	Range	Avg.			
Incandescent	8-18	14	Excellent (100)	Homes, restaurants, general lighting emergency lighting	1000
Fluorescent lamps	46-60	50	Good w.r.t coating (67-77)	Offices, shops, hospitals, homes	5000
Compact fluorescent Lamps (CFL)	40-70	60	Very Good (85)	Hotels, shops, homes, offices	8000-10000
High pressure mercury (HPMV)	44-57	50	Fair (45)	General lighting in factories, garages, car parking. flood lighting	5000
Halogen lamps	18-24	22	Excellent (100)	Display, flood lightening, stadiumexhibition grounds, construction areas	2000 - 4000
High pressure sodium (HPSV) SON	67-121	90	Fair (22)	General lighting in ware houses, factories, street lighting	6000 - 12000
Low pressure sodium (LPSV) SOX	101-175	150	Poor (10)	Roadways, tunnels, canals, street lighting	6000 - 12000
Metal halide lamps	75-125	100	Good (70)	Industrial bays, spot lighting, flood lighting, retail stores	8000
LED Lamps	30-50	40	Good (70)	Reading lights, desk lamps, night lights, spotlights, security light signage lights, etc.	40000 - 100000

6. OTHER POWER CONSUMPTION

Inventory of IT Infrastructure

Device Type	Count
Printer 1500W	04
Computer 500W	161
Camera	52
Telephone	01
Inverter 1000W	02
Interactive Board	01
Projector	01
Hot Air Oven	01
Podium	01
Total	**224**

Water pump details

Sr. No.	Description	Unit	Pump No.-1
1	Rated Power of Motor	KW	1 HP
2	Motor Eff.	%	0.8
3	Discharge Head	m	70
4	Suction Head	m	650
5	Pump Type	Type	Submersible

Exhaust fan details

Device Type	Count
Air Purifier/ Cooler	1/1
Water Purifier/ Water Cooler	2/2
Refrigerator 1000w	02
60w Exhaust Fan	01
Total	**09**

ANALYSIS

There should be regular maintenance schedule of equipment like pumps, exhaust fans and IT equipment. Electronics such as computers, printers, scanners, etc. more than 3 year or 5 years (as per their life) should be replaced with new computers/laptops. Ideal Temperature should be maintained for all electronic appliances.

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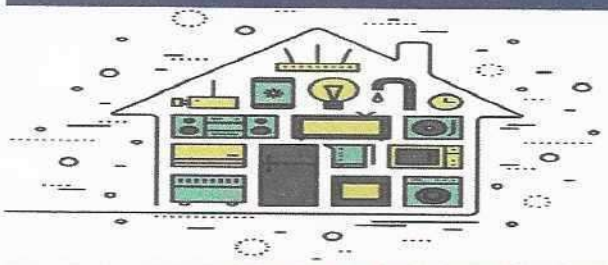

Energy Audit

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20-11-21

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kg	Kilogram
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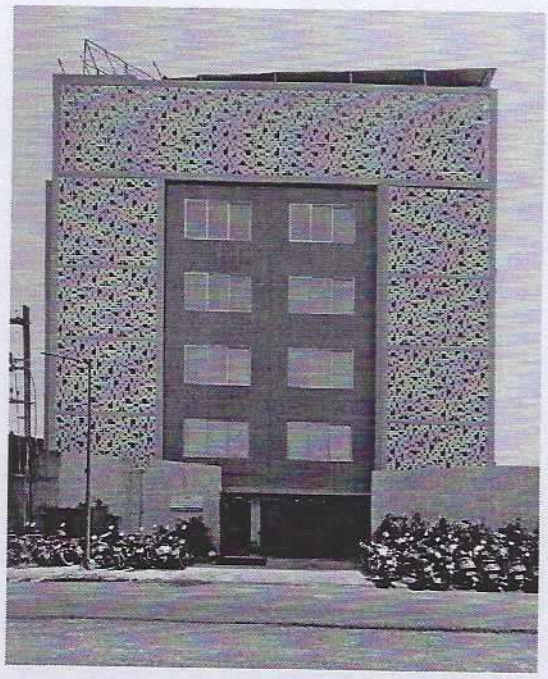
kWp	Kilowatt peak
LED	Light Emitting Diode
LPG	Liquefied Petroleum Gas
MMS	Module mounting structure
MPPT	Maximum Power Point Tracker
NAAC	The National Assessment and Accreditation Council
SEC	Specific Energy Consumption
SPV	Solar Photovoltaic
STC	Standard Test Condition
TV	Television
V	Volts
W	Watts
W/m2	watt per square metre

OVERVIEW OF THE COLLEGE

Catalyst College is a permanently affiliated to Patliputra University, Patna. It was established in the year 2013. The college possesses a campus of 1.07 acre with a student strength of 159 and 39 strong core faculty members along with visiting / guest faculties along with guest faculties located in the urban area of Patliputra Industrial Area, Patna, Catalyst College was born out of a vision to address the critical need for qualified educators and to provide a platform for quality education. The founders envisioned an institution that would not only impart academic knowledge but also instill values of social responsibility, ethical conduct, and community service among its students.



As an institution of learning it has a commanding presence both in the University as well as in thecapital of the state while maintaining its exemplary record in University examinations.

GREEN INDIA MISSION ESTD.-2017 PATNA (BIHAR)

MISSION

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1. **Skill Development**: We are committed to enhancing the skills of unskilled and semi-skilled individuals, school and college dropouts, and underprivileged members of society. Through industrial training and a robust curriculum, we aim to enable them to achieve high performance.
2. **Empowerment of Underprivileged Communities**: Our focus is on providing affordable vocational education to weaker sections of society, particularly in the backward regions of eastern India. By implementing sound business and management practices, we aim to help individuals earn a sustainable livelihood, contributing to poverty alleviation.
3. **Optimization of Human Potential**: We strive to unlock the potential of people in eastern India, particularly in rural and semi-rural areas. By offering superior training solutions, we enhance their engagement in various vocations, fostering happiness and prosperity.
4. **Compassionate Vocational Training**: We actively serve the community by providing high-quality, compassionate livelihood training. Our goal is to make human resources more productive and proactive, empowering individuals to contribute meaningfully to society.
5. **Youth Empowerment**: We focus on preparing youth to become productive adults through entrepreneurship development, technology innovation, and skill education. By equipping them with essential knowledge and skills, we aim to improve their quality of life and that of their families and communities.

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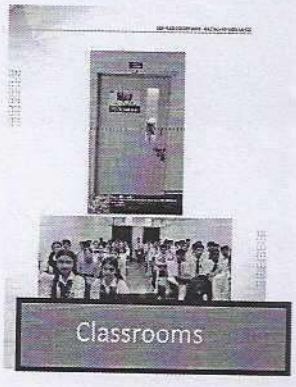

Classrooms


Conference Hall


Classrooms

AUDIT PARTICIPANTS

On behalf of College Administration

Name	Designation
Mr. Neeraj Agrawal	*Principal*
Mr. Amit Shukla	*IQAC Coordinator*
Dr.Pawan Kumar Jha	*Member*
Dr.Neeraj Poddar	*Member*
Dr.Reena Prasad	*Member*
Ravi Kumar Soni	*Member*
Nitish Rohitgi	*Member*

On behalf of Green India Mission

Name	Position	Qualifications
Dr.Arvind Kumar Singh	**BEE & BIS Certified Auditor**	*Ph.D.,MSc.(Environment & Management)*
Dr. Mirza H. Abbas	**Co-Auditor**	M.Sc(Physics), Field Expert

EXECUTIVE SUMMARY

The purpose of this Energy Audit was to seek opportunities to improve the energy efficiency of the Catalyst College . Reducing the energy consumption despite improving the human comfort, health and safety were of primary concern.

Beyond just identifying the energy consumption pattern, this audit sought to detect and categorize the most energy efficient appliances. Additionally, some daily practices relating common appliances have been shared which may help reducing the energy consumption. Data collection for energy audit of the campus was carried out by the AYAN ENTERPRISES Team. The Energy Audit Report accounts for the energy consumption patterns of the institution on actual survey and detailed analysis during the audit.

The work comprehends the area wise consumption computed using suitable equipment. The analysis was carried out by our team with the support of the staff members from Catalyst College.The report provides a list of possible actions to preserve and efficiently access the available source, resources and their saving potential was also identified. We look forward towards optimization

that the authorities, students and staff members would follow the recommendations in the best possible way. The report is based on certain generalizations including the approximations wherever necessary. The views conveyed may not reveal the general opinion. They merely represent the opinion of the team guided by the interviews of clients. We are happy to submit this Energy audit report to the Catalyst College.

ENERGY AUDIT - ANALYSIS

1. ENERGY CONSUMPTION

To understand the Energy Consumption trends and to analyze the average monthly consumption we have collected electricity energy bills from July 2021 to June 2022

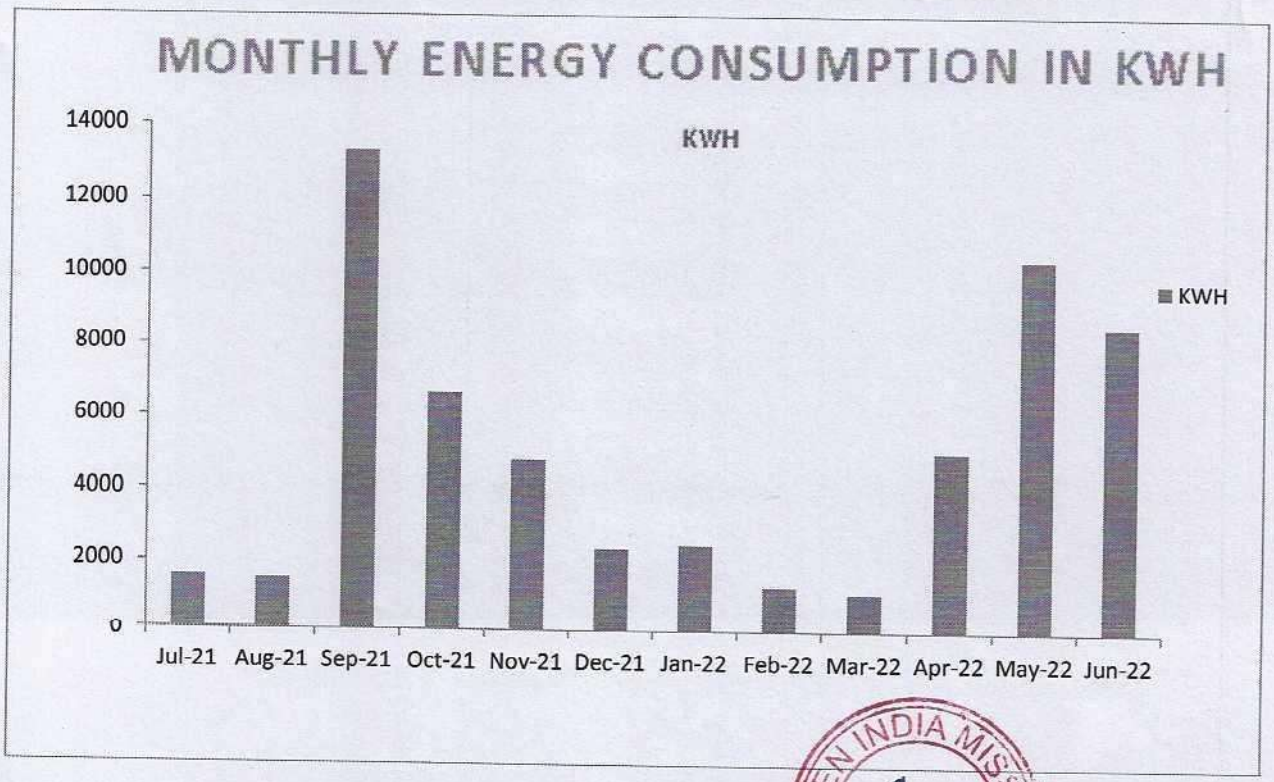
The details of **"Meter Connection"** at **"Catalyst College"** are as follows-

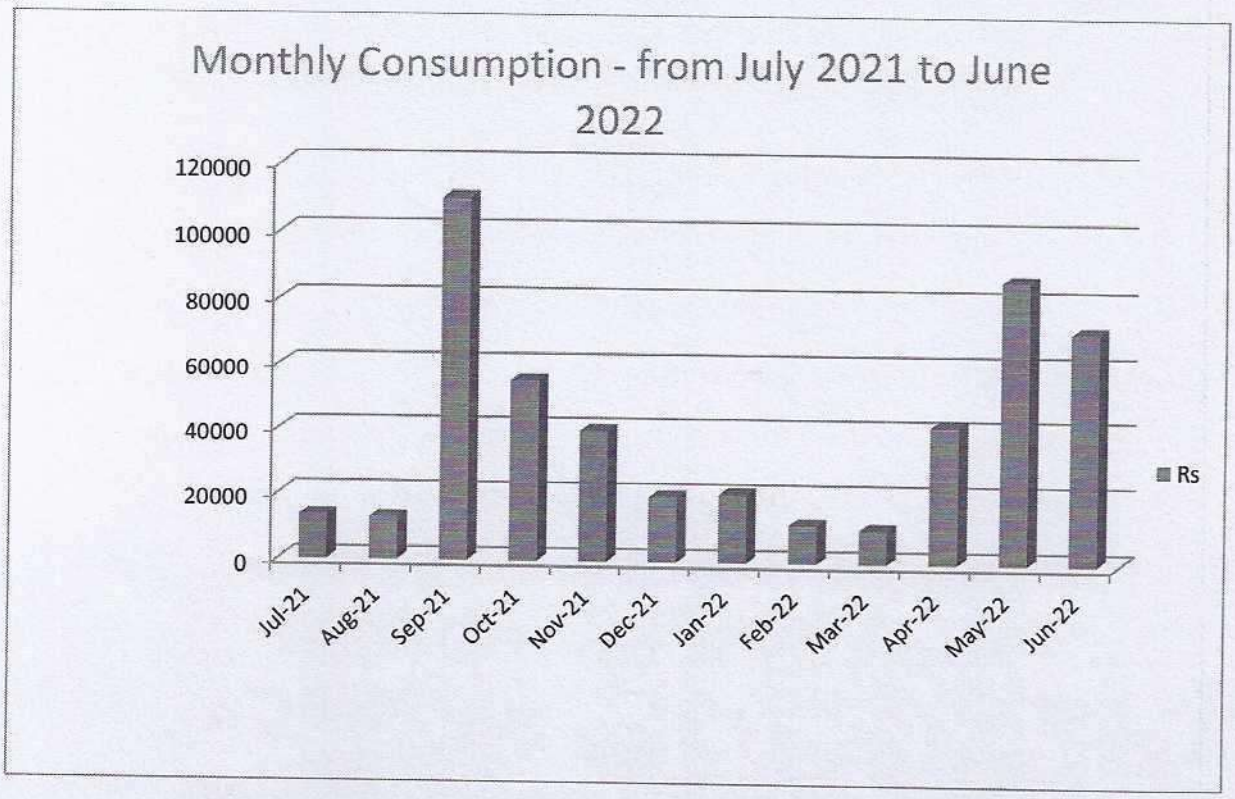
Name	-	SRI VIJAYAM EDUCATIONALS TRUST
CA No.	-	102381540

1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

To understand the Energy consumption trend and to develop the baseline parameter we have collected monthly energy bills for the 12 months i.e. from July 2021 to June 2022.

Month	Solar PV	CA No. 102381540 Total Readings	Rate INR	Amount in INR
Jul-21	5000	1614	8.30	13396.2
Aug-21	5000	1525	8.30	12657.5
Sep-21	5000	13313	8.30	110497.9
Oct-21	5000	6625	8.30	54987.5
Nov-21	5000	4799	8.30	39831.7
Dec-21	5000	2381	8.30	19762.3
Jan-22	5000	2493	8.30	20691.9
Feb-22	5000	1355	8.30	11246.5
Mar-22	5000	1180	8.30	9794
Apr-22	5000	5053	8.30	41939.9
May-22	5000	10449	8.30	86726.7
Jun-22	5000	8578	8.30	71197.4
Total	**60000**	**59365**		**492729.5**





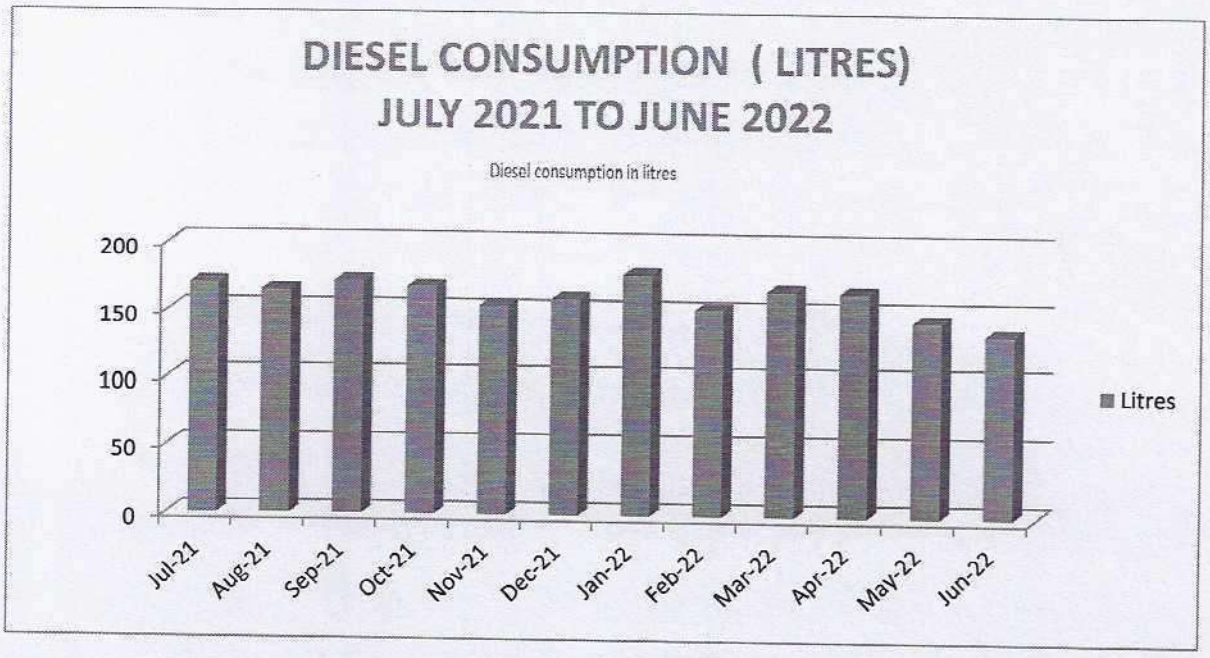
	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Rs	13396.2	12657.5	110497.9	54987.5	39831.7	19762.3	20691.9	11246.5	9794	41939.9	86726.7	71197.4

2. DIESEL CONSUMPTION

Below is the diesel consumption details in liters from July 2021 to June 2022.

Period	Diesel consumption (in liters)
Jul-21	170
Aug-21	165
Sep-21	172
Oct-21	168
Nov-21	155
Dec-21	160
Jan-22	178
Feb-22	153
Mar-22	167
Apr-22	166
May-22	145
Jun-22	135
Total	1934

Note: College doesn't have records of monthly diesel consumption, so average value has been taken based on college's representative suggestion

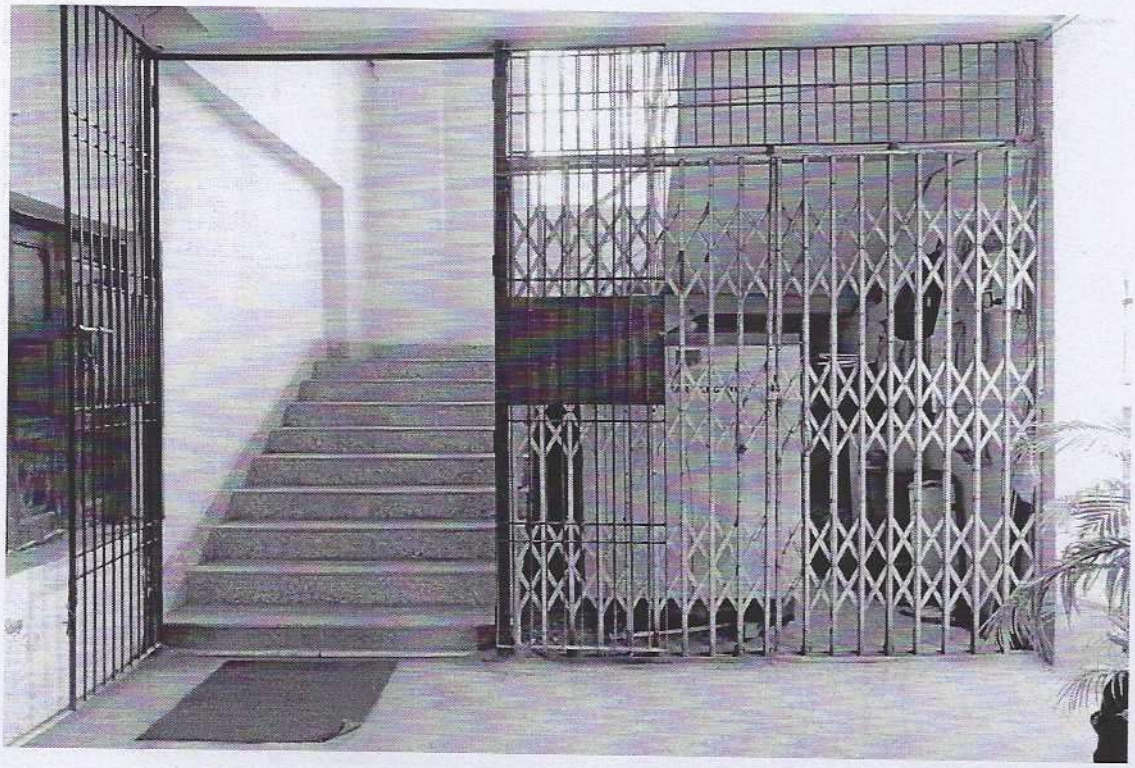


3. ANALYSIS OF DG SETS

In the campus, there are one Diesel Generator (DG) set for its electrical power needs in caseof Grid power failure. DG set capacity is 62.5 kVA.

DG Set Design Details		
Description	*Unit*	*DG at Station*
Rated capacity	kVA	62.5
Hz		50
Sl No.		4R1040-T
Make		Kirloskar
Rated Power	kW	62
PF		0.8 Cos f
Phase		03
Noise Limit		75 db
Amps	Amps	87.5
Mfg.		2007

GREEN INDIA MISSION ESTD.-2017 PATNA (BIHAR)



DG Set Operation details		
Operating hours during testing	Hours	0.50
% Loading	%	66.54
Energy Generation	kWh	33.86
Load	kVA	93.65
Fuel consumption during testing	Litre	06
Specific energy generation	kWh/litre	3.17

Observation and Suggestions:-

Soundproof silent generators are an efficient tool to keep both noise and vibration at low levels. For this purpose the power backup of the institution, the soundproof model is installed.

As per the trial taken during the energy audit the percentage loading of DG set is 66.54% which is ok and specific energy consumption of DG Sets 3.17 kWh/Litre which is satisfactory because as per manufacturer recommendation, best practices for SEC in DG sets range from 3.0 to 3.5 kWh/Litre and above.

We recommend college to initiate periodic maintenance schedule and monitoring of DG set through authorized lab.

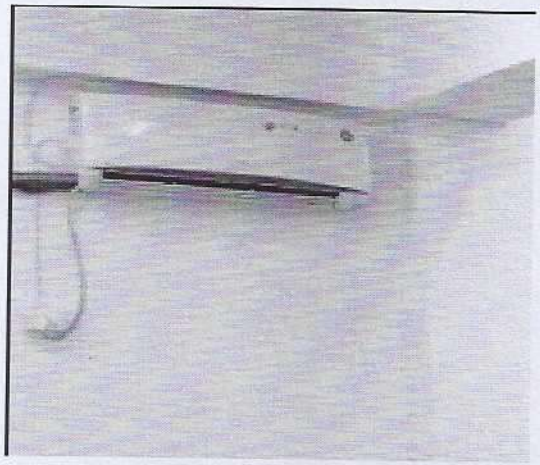
4. AC SYSTEM

Energy Efficiency Ratio (EER): Performance of smaller chillers and ground floor units is frequently measured in EER rather than kW/ton. EER is calculated by dividing a chiller's cooling capacity (in Btu/h) by its power input (in watts) at full-load conditions.

There are 03 ACs installed in Catalyst College in various areas of various capacity the detail is given below:-

Location	Number of AC
Principal chamber	01
Staff room	02
Administrative Block Ground	01
Total	**04**

Remarks: - We have checked Energy Efficiency Ratio of AC's and EER of AC's is fairly OK. But in future you should purchase 3-Star rated inverter based split AC's because power consumption of Inverter based BEE 3-Star rated AC's is less than non-star rated AC's.



We recommend Catalyst College to organize periodic maintenance schedule and take corrective actions for insulating of AC's refrigerant lines in order to protect energy losses.

GREEN INDIA MISSION * ESTD.-2017 * PATNA (BIHAR)

5. FANS ANALYSIS

In the Catalyst College, there are 106 fans installed. The observation and suggestionare given below.

Fans wattage	Count
Ceiling Fan-	106
Bulb Led	339
Tube light	94
Total	**539**

Observation and Suggestions:-

In the college, all the ceiling fans are of 60 W but BEE 5 Star Rated of 30W Ceiling Fans are present in the market. We recommend replacement to BEE 5 Star rated 30W fans.

Note:- Energy saving will increase or decrease if operating hours of machine /equipment will be increased or decreased and payback period will also increase or decrease if cost of investment (Cost of machine/equipment/accessories of machine) will increase or decrease because cost of investment is taken on tentative basis.

Lights type (based on wattage)	Count
18W LED Light	60
12 W LED Round	25
36W LED	100
36W Tube light	90
Total	**275**

Lux Measurement

Description	Lux	Remark
Class Rooms	120 to 235	Acceptable
Offices	130 to 240	Acceptable
Corridors	35 to 90	Acceptable
Washrooms	45 to 76	Acceptable
Outdoor	36 to 95	Acceptable
Computer Lab	150 to 289	Acceptable

Parking area	45 to 94	Acceptable
Canteen	69 to 185	Acceptable

Observation

College has initiated LED based lighting solution, but still there are 100 (36W) tube lights. LEDs save energy, the life span is much greater and emit virtually no heat. We recommend to replace the tube lights with LEDs.

Additionally, we recommend to install motion sensor-based lights in common areas such as library, washrooms, corridors, etc.

We also recommend to use solar lights for open areas like parking, ground, street lights, etc. Table below shows the performance characteristics comparison of all luminaries.

Table - Luminous Performance Characteristics of Commonly Used Luminaries

Type of Lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life
	Range	Avg.			
Incandescent	8-18	14	Excellent (100)	Homes, restaurants, general lighting emergency lighting	1000
Fluorescent lamps	46-60	50	Good w.r.t coating (67-77)	Offices, shops, hospitals, homes	5000
Compact fluorescent Lamps (CFL)	40-70	60	Very Good (85)	Hotels, shops, homes, offices	8000-10000
High pressure mercury (HPMV)	44-57	50	Fair (45)	General lighting in factories, garages, car parking. flood lighting	5000
Halogen lamps	18-24	22	Excellent (100)	Display, flood lightening, stadiumexhibition grounds, construction areas	2000 - 4000
High pressure sodium (HPSV) SON	67-121	90	Fair (22)	General lighting in ware houses, factories, street lighting	6000 - 12000
Low pressure sodium (LPSV) SOX	101-175	150	Poor (10)	Roadways, tunnels, canals, street lighting	6000 - 12000
Metal halide lamps	75-125	100	Good (70)	Industrial bays, spot lighting, flood lighting, retail stores	8000
LED Lamps	30-50	40	Good (70)	Reading lights, desk lamps, night lights, spotlights, security light signage lights, etc.	40000 - 100000

6. OTHER POWER CONSUMPTION

Inventory of IT Infrastructure

Device Type	Count
Printer 1500W	04
Computer 500W	161
Camera	52
Telephone	01
Inverter 1000W	02
Interactive Board	01
Projector	01
Hot Air Oven	01
Podium	01
Total	224

Water pump details

Sr. No.	Description	Unit	Pump No.-1
1	Rated Power of Motor	KW	1 HP
2	Motor Eff.	%	0.8
3	Discharge Head	m	70
4	Suction Head	m	650
5	Pump Type	Type	Submersible

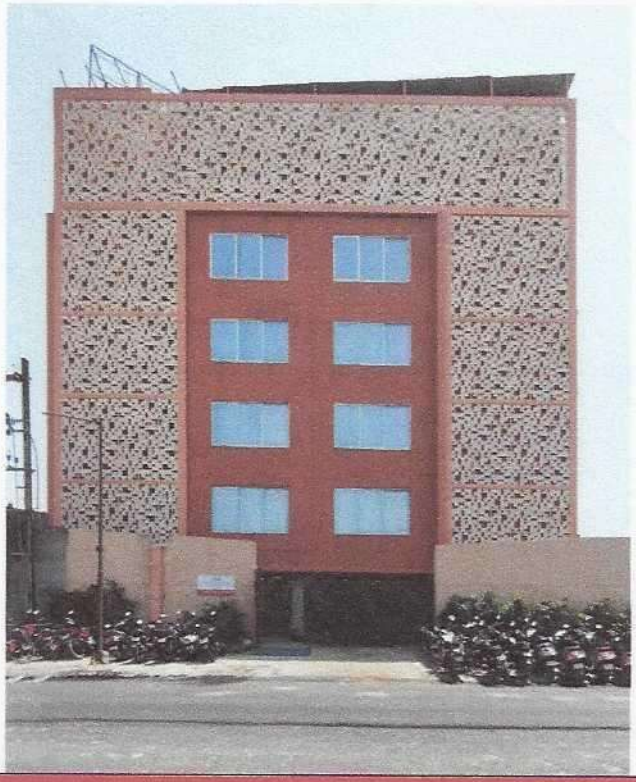
Exhaust fan details

Device Type	Count
Air Purifier/ Cooler	1/1
Water Purifier/ Water Cooler	2/2
Refrigerator 1000w	02
60w Exhaust Fan	01
Total	09

ANALYSIS

There should be regular maintenance schedule of equipment like pumps, exhaust fans and IT equipment. Electronics such as computers, printers, scanners, etc. more than 3 year or 5 years (as per their life) should be replaced with new computers/laptops. Ideal Temperature should be maintained for all electronic appliances.

******* END OF THE REPORT *******



CATALYST COLLEGE

ENVIRONMENT AUDIT REPORT

2020-21

PREPARED BY
GREEN INDIA MISSION
IN ASSOCIATION WITH AYAN ENTERPRISES

Table of content

ACKNOWLEDGEMENT

GREEN INDIA MISSION would like to thank the management of Catalyst College, Patna for assigning this important work of Environment Audit. We appreciate the co-operation to the teams for completion of assessment.

First of all, we would like to thank *Neeraj Agrawal-Principal* for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank Amit Shukla - Audit Coordinator, for his/her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

1. *Dr.Neeraj Kumar*
2. *Mr. Nitish Rohitgi*
3. *Dr.Pawan Kumar Jha*
4. *Dr.Reena Prasad*
5. *Mr. Ravi Kumar Soni*
6. *Dr. Priyadarshi Jain*

08/02/2021.

General Secretary
Green India Mission
Patna (Bihar)

GREEN INDIA MISSION * PATNA (BIHAR) * ESTD 2017

DISCLAIMER

GREEN INDIA MISSION Audit Team has prepared this report for Catalyst College based on data submitted by the representatives of College complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made available and no responsibility and liability is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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GREEN INDIA MISSION, its staff and agents shall keep confidential all the information relating to your organisation and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies.

GREEN INDIA MISSION staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a need to know basis.

Dr. Arvind Kumar Singh
BEE & BIS Certified Auditor
ID No.EM-7059/2017 SIM-14595

General Secretary
Green India Mission, Patna
Patna (Bihar)

GREEN INDIA MISSION ESTD. 2017 PATNA (BIHAR)

CONCEPT AND CONTEXT

Environment Protection Act, 1986 by the Ministry of Environment of forests on 13th march, 1992. As per this act, every person owning an industry or performing an operation or process needs a legal consent and must submit an environmental report or statement.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the sustainable environment.

In view of the NAAC circular regarding environment auditing, the College management decided to conduct an external environment assessment study by a competent external professional auditor.

The term 'Environmental audit' means differently to different people. Terms like 'assessment', 'survey' and 'review' are also used to describe similar activities. Furthermore, some organizations believe that an 'environmental audit' addresses only environmental matters, whereas others use the term to mean an audit of health, safety and environment-related matters. Although there is no universal definition of Environment Audit, many leading companies/institutions follow the basic philosophy and approach summarized by the broad definition adopted by the International Chambers of Commerce (ICC) in its publication of Environmental Auditing (1989).

The ICC defines Environmental Auditing as:

"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects."

This audit focuses on the environment legal compliances and implementation of rules defined by MOEFCC or state pollution control board. The concepts, structure, objectives, methodology, tools of analysis, and objectives of the audit are discussed below.

INTRODUCTION

Nature is God gifted precious gift for all of us. Disturbance in the nature causes environmental Problems. These are increasing day by day as a result of development of urbanization and industrialization on earth. Because of unplanned utilization of resources, our planet is facing tremendous pressure results a sharp rise in temperature. Therefore, there is an urgent need to plan the consumption of the resources in sustainable manner in order to conserve natural resources for future generation.

Sustainable development is becoming popular in the world for saving the earth. Utilizing resources in judicially can save the earth's precious resources. Measurement of environmental components is the most effective step to conserve and protect natural resources.

Environmental auditing had begun in the early 1970s with provision of civil lawsuits for non-compliance with environmental regulations. Environment auditing involves on site visit, collection of samples, performing analyses, and report results to competent authorities.

Industry, the corporate world is initiating auditing for saving natural resources. Academic institutions also can contribute to the preservation and conservation of resources within their premises.

In this "Environment Audit" report would help everyone to think about preserving resources, show willingness to learn their importance, adopt steps to minimize resource use and set an example for others to follow the path of eco-friendly practices to achieve the goal of sustainable development. Effective implementation of environmental auditing helps in minimization of environmental risks at low cost.

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On behalf of college

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Dr. Priyadarshi	*Member*

On behalf of GREEN INDIA MISSION

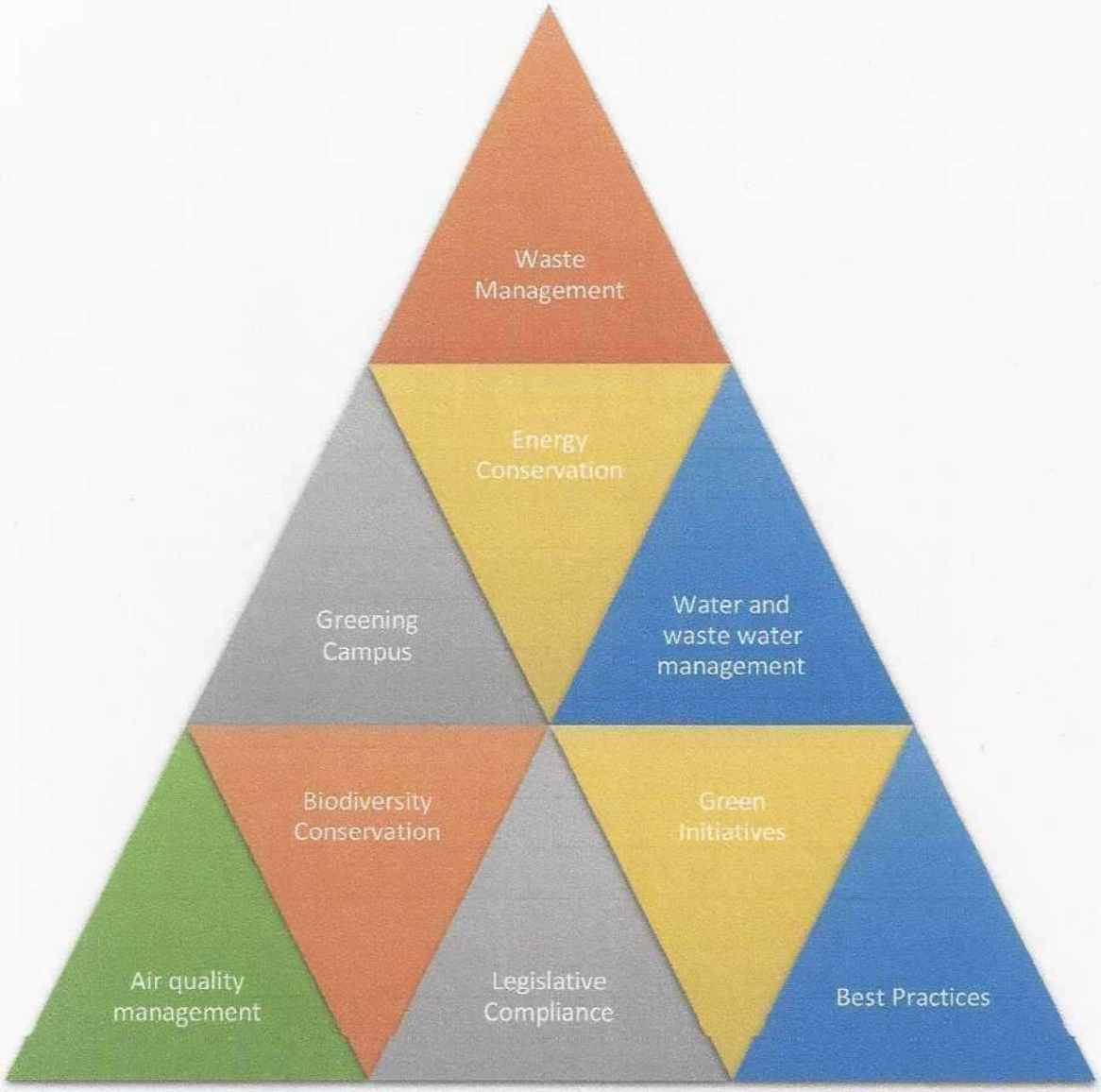
Name	Position	Qualifications
Dr. Arvind Kumar Singh	**BEE & BIS Certified Auditor**	*Ph.D., MSc. (Environment & Management)*
Dr. Mirza H. Abbas	**Co-Auditor**	M.Sc(Physics), Field Expert

EXECUTIVE SUMMARY

The environment assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes out-dated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. Our approach to promote a Green Campus to inculcate the sustainable value systems among the students, so that they carry the learning and practices them in their future endeavours. This will ensure that Sustainability and Environmental practices get embedded in all the institutions and organizations in the country.

A Green Campus is a place where environmentally friendly practices and education combine to promote sustainability in the campus which ultimately offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social and economic needs of the mankind.

This is very second environment audit of College for doing their bit towards environmental protection and environmental awareness at local and global front. Audit criterion is environmental cognizance, waste minimization and management, biodiversity conservation, water conservation, energy conservation and environmental legislative compliance by the campus. A questionnaire is used during audit. This audit report contains observations and recommendations for improvement of environmental consciousness.



WASTE MANAGEMENT

TYPES OF WASTE ON COLLEGE CAMPUS

To create effective waste management plans, College first need to know the types of waste they produce. Below, we have compiled a list of various kinds of waste commonly generated on institutional campus:

1. **Food Waste** - College campus generates food waste. The average mess and canteen generates approximately 5 kg of food waste a day. The reasons for food waste on an educational campus may be over purchasing food to ensure a sufficient supply and then throwing it away, especially in canteen/cafeteria where plentiful stores are essential. And in the cafeteria, students may pile food on to their ample trays, find it unappealing once they sit down and dutifully scrape it into the garbage. Immediate attention is given to the food waste minimization techniques.
2. **Recyclable Paper, Cardboard, Plastic, Glass and Cans** -Campus tends to produce vast quantities of these recyclables. Even in the digital age, many students, professors and staff members still prefer handwritten notes and end up with piles of unwanted paper once their courses and projects are complete. The snacks so essential for socializing tend to come in recyclable plastic, glass or aluminum containers. And shipments of necessary items throughout the year are likely to arrive in recyclable plastic and cardboard packaging. The same is sold/auctioned to the scrap vendors time to time.

3. **Student Clothes and House wares**- As we have mentioned above, many students find it more convenient to throw away their clothes and dorm furnishings at the end of the year than donate or recycle them.

4. **E–Waste-Student and facility electronics often form a large portion of a campus's waste** — As campus continually upgrade their computing facilities and office computer stoke pup with the latest technology, the old computers have to go somewhere. Same is the case with old printers, phones, copy machines and other electronics that receive upgrades over the years. Discarded student electronics often become part of a College's waste stream as well. Students may throw away old phones, TVs, tablets, laptops and printers, along with cords and other accessories. Recycling is a much more eco-friendly option — the metals in old electronics often have a high reuse value. College has tie-up with external authorized agency details mentioned in legislation compliances.

5. **Maintenance Waste**- In the maintenance department, spent paints, solvents, adhesives and lubricants all form potentially hazardous waste. Because they are difficult to recycle, spent incandescent light bulbs usually become landfill waste. Spent fluorescent light bulbs, which contain small amounts of mercury, typically require special handling because of the environmental and health risks they pose.

6. **Furniture** - Furniture waste on a college campus has a couple different sources. The campus itself may also get rid of old furniture as it modernizes its classrooms, cafeterias, computer labs and study spaces. Annually sold to junk dealer.

7. **Books/Magazines/Newspapers** - Books accounted for solid waste generation and College often generate tons of textbook waste. As courses upgrade to new editions, they may end up throwing their newly obsolete textbooks into the garbage if donation programs cannot use them. Students of Catalyst College for Teacher Education donates their text books and notes to junior students, or else are auctioned to reseller.

8. **C & D Waste** - Expansion of college campus building and renovation works result significant amount of construction and demolition waste that should be either used for back filling or disposed off through authorized dumping site by CPCB/SPCB.

9. **Solid Waste** - The College is managing solid waste by providing it to the Municipal Corporation.

ENERGY CONSERVATION

1. **List ten ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.**

   - *Using Energy efficient appliances*
   - *Switching off the electrical equipment when not in use*
   - *Use of Air conditioners at optimum temperatures as per the utilization schedule*
   - *LED lights installed*

2. **Are there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some**

   Yes, CATALYST COLLEGE has adopted energy saving techniques
   - *LEDs installed*
   - *Use of Air conditioners at optimum temperatures*
   - *Solar panels installed*

3. **How many CFL/LED bulbs has your institute installed?**

   CATALYST COLLEGE has replaced almost 99% of the conventional bulbs and tube lights with LED Lights.

4. **Do you run "switch off" drills at institute?**

Yes

5. **Are your computers and other equipment's put on power-saving mode?**

Yes, CATALYST COLLEGE *put the equipment on power saving mode*

WATER AND WASTE-WATER MANAGEMENT

1.List uses of water in your institute

Basic use of water in campus:

Drinking– 22.43KL/month

Gardening–5.0Kl/month

Kitchen and Toilets –29.44KL/month

Others – 40.02KL/month

Total = 96.89KL/Month

Note: Water calculations are carried out on basis of National Building Code2016

2 How does your institute store water? Are there any water saving techniques followed in your institute?

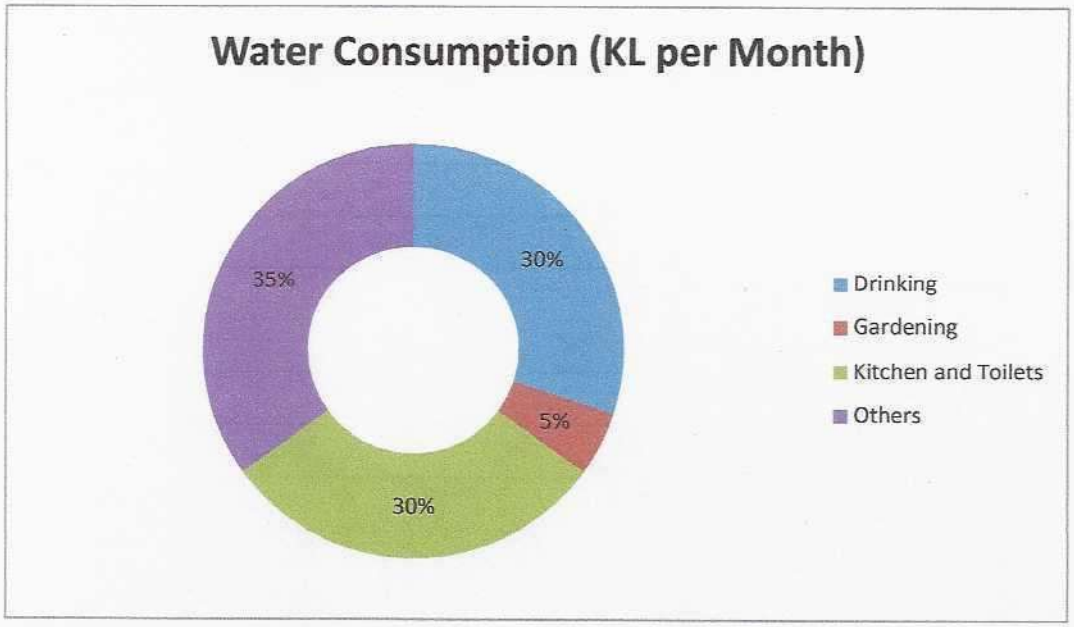
College stores water in terrace tanks.

Saving Techniques
Avoid overflow of water-controlled valves are provided in water supply system.
Close supervision for water supply system.
Rain water harvesting pits are there for ground water recharge.

3. Locate the point of entry of water and point of exit of waste water in your institute. (Entry and Exit)

Entry- Water comes from Municipal Corporation, Borewell and Rain water Harvesting.

Exit- From Canteen, Toilets, and bathrooms through covered drainage which is connected to sewage line and Soakpit.



4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Water Conservation awareness for new students*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*
- *Reuse RO waste water in washrooms*

5. Does your institute harvest rainwater?

Yes ,there are rainwater harvesting pit for better ground water recharge

6. Is there any water recycling System?

YES

AIR QUALITY MANAGEMENT

1. Are the Rooms in Campus Well Ventilated?

Yes, as per National Building Code, guidelines

2. Window Floor ratio of the Rooms?

Very Good, ample daylight utilization because of big windows.

3. What is the ownership of the vehicles used by your campus?

CATALYST COLLEGE *have no own Vehicles.*

4. Provide details of college-owned vehicles?

Details of college-owned vehicles	*Buses*	*Cars*	*Vans*	*Other*	*Total*
No. of vehicles	*0*	*0*	*0*	*0*	*0*

5. PUC done?

NA

6. Specify the type of fuel used by your campus's vehicles

NA

8.Air Quality Monitoring Program (If,Any)

No monitoring is being done

ENVIRONMENT LEGISLATIVE COMPLIANCE

1. Are you aware of any environmental Laws Pertaining to different aspects of environmental management?

Yes

2. Does your institute have any rules to protect the environment? List possible Rules you could include.

Yes, the eco harmony club of CATALYST COLLEGE *is conscious of the environmental protection and takes proper measures in terms of awareness campaigns, activities, etc.*

3. Does Environmental Ambient Air Quality Monitoring conducted by the Institute?

No

4. Does Environmental Water and Waste water Quality monitoring conducted by the Institute?

No

5. Does stack monitoring of DG sets conducted by the Institute?

No

6. Is any warning notice, letter issued by state government bodies?

No

7. Does any Hazardous waste generate by the Institute?

Yes, computer scrap is generated by the Institute

GENERAL INFORMATION

1. Does your institute have any rules to protect the environment? List possible rules you could include.

Yes, CATALYST COLLEGE *eco club carries out various programs for environment protection periodically on the campus.*

2. Are students and faculties aware of environmental cleanliness ways? If Yes Explain

Yes, college organizes various activities for environment cleanliness

- *Reduce carbon footprints by opting energy saving methods and using public commutes.*
- *Recycling of waste products*
- *Avoid single use plastic*
- *Less use of paper*

3. Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?

Yes, World Environment Day, Ozone Day, Earth Day, and more are celebrated by campus. Furthermore, CATALYST COLLEGE *organizes different activities like Donation drive, cleanliness drive, awareness on Namami Gange project, plantation drive and many more.*

4. Does Institute participate in National and Local Environmental Protection Movement?

No

5. Does Institute have any Recognition or certification for environment friendliness?

Yes

6. Does Institution conduct a green or environmental audit of its campus?

Yes,this is first time environmental audit carried out by the College.

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BEST PRACTICES

- There is ban on single use plastic and plastic crockery in the campus.
- College has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- Personal Vehicles (Students) are not allowed in the campus
- College has two types of containers for disposing the waste material – (i) Green Color for Wet organic waste material, (ii) Blue Color for dry waste material.
- Solar panels (05kWp) have been installed in the campus.
- Installation of rain water harvesting systems in campus buildings.
- Students are involved in 'Best out of waste projects' such as paper-bag making, cardboard dustbin making etc. for recycling of waste materials. Old newspapers, magazines, answer books etc. are periodically sold to recycling agents.
- Vermi-compost pits present in the Herbal Garden that effectively uses organic plant waste to produce manure that is then used in the college gardens.
- The college is actively engaged in coordinating cleanliness activities within and beyond the campus, aligning with the vision of the Swachh Bharat Abhiyan. This includes raising awareness about cleanliness and hygiene through regular drives, rallies, and the active participation of students and staff in cleanliness efforts.

Initiatives by college's Eco Club

- Cleaning of Marine drive area of Patna Punit Sagar Abhiyan OnSep22,2022
- College participated in Namami Gange project's district conference on 18th Dec 2022
- On the occasion of National youth week (12th Jan 2023), awareness campaign was carried out in nearby slum area (Digha Ashiyana area) for children along with donation drive
- Sparrow conservation campaign was carried out on World Sparrow Day (20th March 2023)

RECOMMENDATIONS

- College should run Conservation awareness campaigns like online sessions and webinars for students and staff.
- College should get permission from Govt agency for existing bore wells.
- Provide sanitary waste disposal facility as per the CPCB guidelines for management of sanitary waste (as per Solid Waste Management Rules, 2016). Installation of Incinerator is recommended in campus
- Green building guidelines with ECBC compliance should be adopted for future expansion projects of the College.
- Environmental Monitoring i.e.(Ambient Air Quality monitoring, Stack Monitoring of DG sets, Water monitoring need to be conducted by State Pollution Control Committee, approved laboratory) should be conducted periodically.
- Agreement with third party authorised vendors should be done for different types of waste management, such as paper recycling, e-waste, BMW, Plastic waste, etc.
- Eco-friendly parameters should be included in the purchase of articles and goods for the campus.

CONCLUSION

This audit involved extensive consultation with all the campus team, interactions with key personnel on a wide range of issues related to Environmental aspects. Catalyst College has an eco-club for sustainable use of resources.

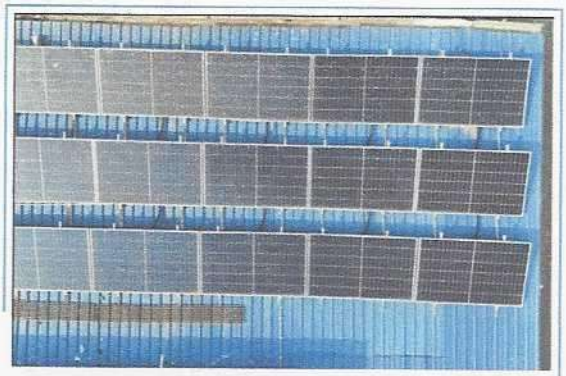
The audit has identified some observations for making the campus premise more environmental friendly. The recommendations are also mentioned with observations for the college campus team to initiate actions. The audit team opines that the overall site is well maintained from an environmental perspective.

Few things that are important to initiate urgently are waste management plan and agreement with third party authorised vendors for waste management.

REFERENCES

- **The Environment [Protection] Act–1986 (Amended1991) & Rules-1986 (Amended2010)**
- **The Petroleum Act:1934– The Petroleum Rules: 2002**
- **The Central Motor Vehicle Act: 1988 (Amended2011) and The Central Motor Vehicle Rules: 1989 (Amended in 2005)**
- **Energy Conservation Act 2010.**
- **The Water [Prevention & Control of Pollution] Act –1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules – 1975**
- **The Air [Prevention & Control of Pollution] Act –1981 (Amended1987) TheAir (Prevention & Control of Pollution) Rules – 1982**
- **The Gas Cylinders Rules–2016 (Replaces the Gas Cylinder Rules–1981**
- **E-waste management rules 2016**
- **Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended2006)**
- **The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)**
- **The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)**
- **The Batteries (Management and Handling) rules, 2001 (Amended 2010)**
- **Relevant Indian Standard Code practices**

ANNEXURE II - PHOTOGRAPHS



GREEN INDIA MISSION

Generator

Water Tank

************END OF THE REPORT************

Registration No. 10314/2017

Green India Mission

let's go green planet

(A Unit of Ayan Enterprises, Patna)

Audit Certificate

Catalyst College, Patna

Plot No. C16 (P), Patliputra Industrial Area, Patna - 800013, Bihar

Has been assessed by Green India Mission, Patna for the comprehensive study of environmental impacts on institutional working framework to fulfill the requirement of

ENVIRONMENT AUDIT

ACADEMIC YEAR 2020-21

The environment legal compliances and initiatives carried out by the institution have been verified in the report submitted and were found to be satisfactory.

The efforts taken by the management and faculty towards environment sustainability are highly appreciated and noteworthy.

The institution is credited score 8.19/10 Certificate No. GIM/EVA/18/2020-21

Principal
CATALYST COLLEGE
Plot No.- C-16(P) Patliputra Industrial Area
Patliputra, Patna-13

Senior Auditor
Green India Mission

President
Green India Mission

General Secretary
Green India Mission

Green India Mission associate with Ayan Enterprises, Patna
Head Office: 27/393A, Trilokpuri, Mayur Vihar Phase I, New Delhi – 110091
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E-mail : greenim@gmail.com logon : www.greenim.org

CATALYST COLLEGE

Address : PLOT NO. C16(P), INFRONT OF COCA COLA, PATLIPUTRA INDUSTRIAL AREA, PATNA - 800013, BIHAR

GREEN AUDIT REPORT

2020-2021

PREPARED BY

GREEN INDIA MISSION

IN ASSOCIATION WITH AYAN ENTERPRISES

GREEN INDIA MISSION ESTD-2017 PATNA (BIHAR)

ACKNOWLEDGEMENT

Green India Mission, Patna would like to thank the management of CATALYST COLLEGE, Patna for assigning this important work of Green Audit. We appreciate the co-operation to the teams for completion of assessment.

First of all, we would like to thank ***Mr. Neeraj Agrawal – Principal and Mr. Amit Shukla, Audit Coordinator*** for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank ***Mr. Amit Shukla - Audit Coordinator***, for her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

1. ***Mr. Nitish Rohitgi***
2. ***Dr. Neeraj Poddar***
3. ***Dr. Pawan Kumar Jha***
4. ***Dr. Reena Prasad***
5. ***Mr. Ravi Kumar Soni***
6. ***Dr. Priyadarshi Jain***

Registration No. 10314/2017

Green India Mission

let's go green planet

(A Unit of Ayan Enterprises, Patna)

Audit Certificate

Catalyst College, Patna

Plot No. C16 (P), Patliputra Industrial Area, Patna - 800013, Bihar

Has been assessed by Green India Mission, Patna for the comprehensive study of green and environmental impacts on institutional working framework to fulfill the requirement of

GREEN AUDIT

ACADEMIC YEAR 2020-21

The green and eco-friendly initiatives and carried out by the institution have been verified in the report submitted and were found to be satisfactory.

The efforts taken by the management and faculty towards environment sustainability and eco-friendly green initiatives are highly appreciated and noteworthy.

The institution is credited score 8.36/10 Certificate No. GIM/GRA/20/2020-21

Principal
CATALYST COLLEGE
Plot No.- C-16(P) Patliputra Industrial Ar...

Senior Auditor
Green India Mission

President
Green India Mission

General Secretary
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Head Office: 27/393A, Trilokpuri, Mayur Vihar Phase I, New Delhi – 110091
Branch Office : 392A Sultanganj, Mahendru, Patna – 800006, Bihar

DISCLAIMER

Green India Mission Audit Team has prepared this report for Catalyst College, Patna based on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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Green India Mission staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

GREEN INDIA MISSION EST. 2017 PATNA (BIHAR)

06.02.21

General Secretary
Green India Mission
Patna (Bihar)

CONCEPT AND CONTEXT

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2020-2021 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization ofIndia that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

In view of the NAAC circular regarding Green auditing, the College management decided to conduct an external environment assessment study by a competent external professional auditor. The green audit aims to examine environmental practices within and outside the college campus, which impact directly or indirectly on the atmosphere. Green audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of college environment. It was initiated with the intention of reviewing the efforts within the institutions whose exercises can cause risk to the health of inhabitants and the environment.

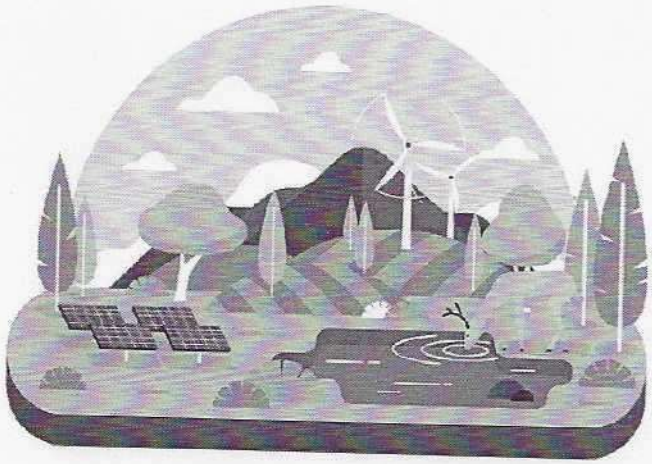
Through the green audit, a direction as how to improve the structure of environment and inclusion of several factors that can protect the environment can be commenced. This audit focuses on the Green Campus, Waste Management, Water Management, Air Pollution, Energy Management & Carbon Footprint etc. being implemented by the institution. The concepts, structure, objectives, methodology, tools of analysis, objectives of the audit as below:

INTRODUCTION

Now a days, the educational institutions are becoming more thoughtful towards the environmental aspects and as a result new and innovative concepts are being introduced to make them sustainable and eco-friendly. To preserve the environment within the institution, a number of viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the saving the energy, waste recycle, water consumption reduction, water harvesting and many more...

The activities carried out by the institution can also create adverse environmental impacts. Green audit is defined as an official inspection of the effects a college has on the environment. Green Audit is conducted to evaluate the actual scenario at the institution campus. Green audit can be a useful tool for a university /college to determine how and where they are using the most of the energy or water or resources; the institution can then decide how to implement changes and make savings. It can also be used to determine the nature and volume of waste, which can be used for a recycling project or to improve waste minimization plan.

Green auditing and the application of mitigation measures is a win-win situation for all the institutions, the learners and the mother earth. It can also result in health awareness and can promote the environmental awareness, values and beliefs. It provides a better understanding to staff and students about the Green impact on institution. Green auditing also upholds financial savings through reduction of resource usage. It gives an opportunity to the students and teachers for the development of ownership of the personal and social responsibility. The audit process involves primary data collection, site walk through with the team of university /college including the assessment of policies, activities, documents and records.



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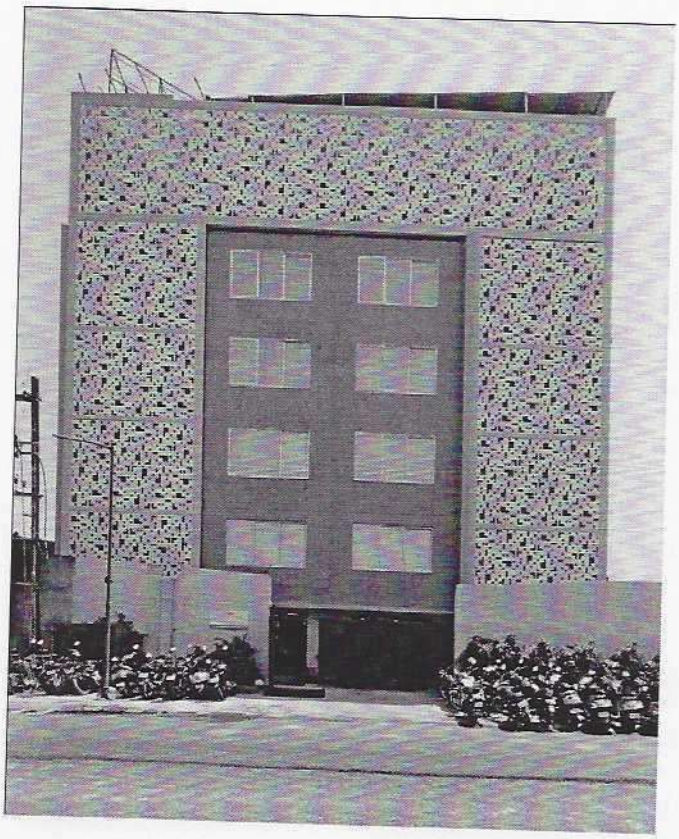
OVERVIEW OF THE COLLEGE

The College is an affiliated to Patliputra University, Patna. It was established in the year 2001. The college possesses a campus of 1.07 acre with a student strength of 67 and 34 strong core faculty members along with visiting / guest faculties along with guest faculties located in the urban area of Patliputra Industrial area, Patna, The College was born out of a vision to address the critical need for qualified educators and to provide a platform for quality education. The founders envisioned an institution that would not only impart academic knowledge but also instill values of social responsibility, ethical conduct, and community service among its students.



As an institution of learning it has a commanding presence both in the University as well as in the capital of the state. The college while maintaining its exemplary record in University examinations.

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MISSION

Our mission is to adapt to the evolving needs of society by focusing on the following key aims:

1. Skill Development: We are committed to enhancing the skills of unskilled and semi-skilled individuals, school and college dropouts, and underprivileged members of society. Through industrial training and a robust curriculum, we aim to enable them to achieve high performance.

2. Empowerment of Underprivileged Communities: Our focus is on providing affordable vocational education to weaker sections of society, particularly in the backward regions of eastern India. By implementing sound business and management practices, we aim to help individuals earn a sustainable livelihood, contributing to poverty alleviation.

3. Optimization of Human Potential: We strive to unlock the potential of people in eastern India, particularly in rural and semi-rural areas. By offering superior training solutions, we enhance their engagement in various vocations, fostering happiness and prosperity.

4. Compassionate Vocational Training: We actively serve the community by providing high-quality, compassionate livelihood training. Our goal is to make human resources more productive and proactive, empowering individuals to contribute meaningfully to society.

5. Youth Empowerment: We focus on preparing youth to become productive adults through entrepreneurship development, technology innovation, and skill education. By equipping them with essential knowledge and skills, we aim to improve their quality of life and that of their families and communities

VISION

Our vision is to maintain an unwavering commitment to the highest quality standards in education, continuously illuminating society with knowledge and innovation. In pursuit of this vision, we are dedicated to:

1. Value-Based Education: We strive to develop and promote a professional educational system grounded in strong values, fostering innovation at every level.

2. Knowledge Advancement: We are committed to keeping pace with the ever-expanding frontiers of knowledge, making significant contributions to the growth of an intellectually vibrant society through pioneering educational initiatives.

3. Inspirational Leadership: As a value-based organization, we aim to inspire leadership and satisfy intellectual curiosity. We embrace a progressive ethos rooted in humanistic traditions, community involvement, accountability, integrity, and respect for all.

By embodying these principles, we stand on the threshold of substantial growth, driven by our continuous commitment to excellence and our proven ability to deliver the best in education. Through this vision, we aspire to empower individuals and communities, shaping a brighter future for all.

GREEN INDIA MISSION * ESTD 2017 * PATNA (BIHAR)

AUDIT PARTICIPANTS

On behalf of Catalyst College, Patna

Name	Designation
Mr. Neeraj Agrawal	*Principal*
Mr. Amit Shukla	*Audit Coordinator*
Dr. Priyadarshi Jain	*Member*
Mr. Ravi Kumar Soni	*Member*
Dr. Reena Prasad	*Member*
Dr. Pawan Kumar Jha	*Member*
Dr. Neeraj Poddar	*Member*
Mr. Nitish Rohitgi	*Member*

On behalf of Green India Mission

Name	Position	Qualifications
Dr. Arvind Kumar Singh	BEE & BIS Certified Auditor	Ph. D , M.sc (Environment & Management)
Dr. Shamin Ahmad	Co- Auditor	*M.Sc (Botany), Field Expert & Environmental Scientist.*

EXECUTIVE SUMMARY

Green auditing is an essential step to identify and determine whether the institutional practices are sustainable and ecological. Traditionally, we were upright and efficient users of natural resources. But over the period of time, excessive usage of resources like water, electricity, petrol, etc. have become habitual for everyone especially, in urban and semi-urban areas. It is actually the right time to check if we (our process) are consuming more than required resources? Whether we are using resources sensibly?

Green audit standardizes all such practices and provides an efficient way to use natural resources. In the time of climate change and resource exhaustion it is necessary to re-check the processes and convert then in to green and sustainable. Green audit provides an approach for the same. It also increases overall awareness among the folks working in institution towards the eco-friendly environment.

This is the second attempt to conduct green audit of this campus for fulfilment of NAAC criteria. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil, water usage, vegetation, waste management practices and carbon foot print of the campus. Initially a questionnaire was shared to know about the existing resources of the campus and resource consumption pattern of the students and staff in the campus.

GREEN AUDIT - ANALYSIS

GENERAL INFORMATION

1. **Was any Green Audit conducted earlier?**

No, this is the First external audit organized by the College

2. **What is the total strength (people count) of the Institute?**

Students
Male: 52 *Female: 15* *Total: 67*

Teachers
Male: 24 *Female: 10* *Total: 34*

Non-Teaching Staff
Male:17 *Female: 8* *Total: 25*

Technical staff
Male: 13 *Female: 2* *Total: 15*

Total Strength
Male: 106 *Female: 35* *Total: 141*

3. **What is the total number of working days of your campus in a year?**

There are one hundred and eighty working days in a year.

4. **Where is the campus located?**

The campus is located at PLOT NO. C16(P), INFRONT OF COCA COLA,PATLIPUTRA INDUSTRIAL AREA, PATNA - 800013, BIHAR

5. **Which of the following are available in your institute?**

Garden area	*Available*
Playground	*Available*
Kitchen	*Available*
Toilets	*Available*
Garbage Or Waste Store Yard	*Available*
Laboratory	*Available*

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6. **Which of the following are found near your institute?**

Municipal dump yard	*Not in vicinity of institute*
Garbage heap	*No Garbage heaps*
Public convenience	*Public convenience is available*
Sewerline	*Approximately 500M sewer line within campus*
Stagnant water	*No stagnant water*
Open drainage	*No*

WASTE MINIMIZATION AND RECYCLING

1. **Does your institute generate any waste? If so, what are they?**

Yes, following waste are generated in campus

- *E-waste from Karo samvabh*
- *Solid waste*
- *Canteen waste*
- *Paper, plastic*
- *Horticulture waste*

2. **What is the approximate amount of waste generated per day? (in Kg approx.)**

Biodegradable waste – 1.6 Kg
Non-biodegradable waste -1.8 Kg Hazardous Waste- 300 gm

3. **How is the waste managed in the Institute? By Composting, Recycling, Reusing, Others (specify)**

- *Catalyst College is using providing segregated solid waste to municipal corporation*
- *The college is making efforts to transition to a paperless environment, adopting digitalization and reducing paper usage through various measures, such as digital storage, digital communication, and e-assignments.*
- *RO wastewater is used in washrooms*
- *Rain water harvesting pits are therefore ground water recharge.*

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4. **Do you use recycled paper in Institute?**

Yes for file covers and internal assessments and also implemented Office Automation and Digitalization work

5. **How would you spread the message of recycling to others in the community?**

College is spreading the awareness about recycling through different activities and campaigns to students, staff and local nearby.

6. Can you achieve zero waste in your Institute? If yes, how?

College is following the five "R" principle of reduce, reuse, recycle, refuse and regenerate to obtain zero waste in campus and also collaboration with Trivikram Empowerment, Patna

GREENING THE CAMPUS

1. Is there a garden in your Institute?

Yes, about 235 Flower Pots are available as Garden

2. Do students spend time in the garden?

No.

3. Total number of Plants in Campus?

Plant type with approx. count	
Full grown Trees	*01*
Small Trees	*11*

4. Is the College campus having any Horticulture Department? (If yes, give details)

No

5. How many Tree Plantation Drives organized by campus per annum?

06 Plantation Drive is carried out annually.Survival rate is more than 80%.andalso participated in Jal Jiwan Harliyali

6. Is there any Plant Distribution Program for Students and Community?

College provides planters to all guests as a gift rather than a bouquet of flowers.

8. Is there any Plant Ownership Program?

Yes Birthday Plantations

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WATER AND WASTEWATER MANAGEMENT

1. List uses of water in your institute

Basic use of water in campus:
Drinking – 74KL/month
Gardening – 10Kl/month
Kitchen and Toilets – 130KL/month
Others – 65 KL/month

2. How does your institute store water? Are there any water saving techniques followed in your institute?

College stores water in terrace tanks.

Saving Techniques

- *Avoid overflow of water-controlled valves are provided in water supply system.*
- *Close supervision for water supply system.*

3. Locate the point of entry of water and point of exit of waste water in your institute.

***Entry**- Water comes from Municipal corporation, borewell and through rain water harvesting*
***Exit**- From Canteen, Toilets, Hostel, bathrooms and Labs through covered drainage which is connected to sewage line*

4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Water Conservation awareness for new students*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*
- *Use of sprinklers for gardening purpose to save water*
- *Push taps are installed to save water*
- *Re use wastewater created by a reverse osmosis (RO) system in washroom*

ANIMAL WELFARE

1. List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.)

No

2. Does your institute have a Biodiversity Program or a KARUNA CLUB?

*Yes, Catalyst College **Eco club** actively organizes awareness through various campaigns and activities including seminars, poster competition, etc.*

GREEN INDIA MISSION * ESTD-2017 * PATNA (BIHAR)

GREEN INITIATIVES

- There is ban on single-use plastic and plastic crockery in the campus.
- College has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- College has three types of containers for disposing the waste material – (i) Green Color for Wet organic waste material, (ii) Blue Color for dry waste material, (iii) Red Color for Hazardous Waste (Electronic waste).
- Solar panels (05kWp) have been installed in the campus.
- Installation of rain water harvesting systems in campus building.
- **Green India Mission** initiative by the college.
- The college is actively engaged with the Green India Mission.
- Students are involved in 'Best out of waste projects ' such as paper- bagmaking, card board dustbin making etc. for recycling of waste materials. Old newspapers, magazines, answer books etc. are periodically sold to recycling agents.
- The college carries out various awareness campaigns, seminars, workshops, and interactive sessions to engage the campus community in the implementation of its Green Campus, Energy, and Environment policies.
- Vermicompost pit is present near the Herbal Garden which effectively uses organic plant waste to produce manure that is then used in the college gardens.
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RECOMMENDATIONS

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- Increase plantation drives in nearby, local bodies, NGOs and Municipal Corporations to balance the carbon emission and absorption.
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CONCLUSION

This audit involves considerable team discussions and meetings with key staff members on a variety of environmental-related topics. The eco club of The College promotes conservation of resources.

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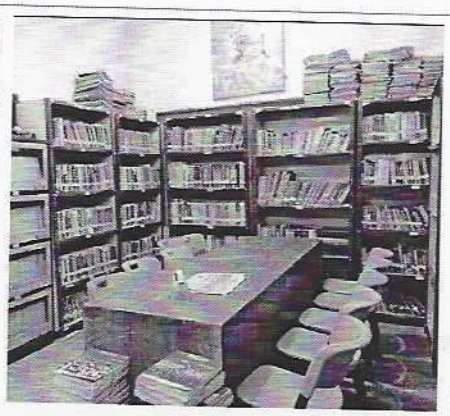
ANNEXURE I–ENVIRONMENT CONSCIOUSNESS PHOTOS

Green Flower Pots



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GREEN INDIA MISSION ESTD. 2017 PATNA (BIHAR)

CATALYST COLLEGE

Address: PLOT NO. C16(P), INFRONT OF COCA COLA, PATLIPUTRA INDUSTRIAL AREA, PATNA - 800013, BIHAR

GREEN AUDIT REPORT

2021-22

PREPARED BY

GREEN INDIA MISSION

IN ASSOCIATION WITH AYAN ENTERPRISES

GREEN INDIA MISSION * PATNA (BIHAR) *

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let's go green planet

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Principal
CATALYST COLLEGE
Plot No.- C-16(P) Patliputra Industrial Area
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Senior Auditor
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14.03.2022

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CONCEPT AND CONTEXT

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2021-22 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

In view of the NAAC circular regarding Green auditing, the College management decided to conduct an external environment assessment study by a competent external professional auditor. The green audit aims to examine environmental practices within and outside the college campus, which impact directly or indirectly on the atmosphere. Green audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of college environment. It was initiated with the intention of reviewing the efforts within the institutions whose exercises can cause risk to the health of inhabitants and the environment.

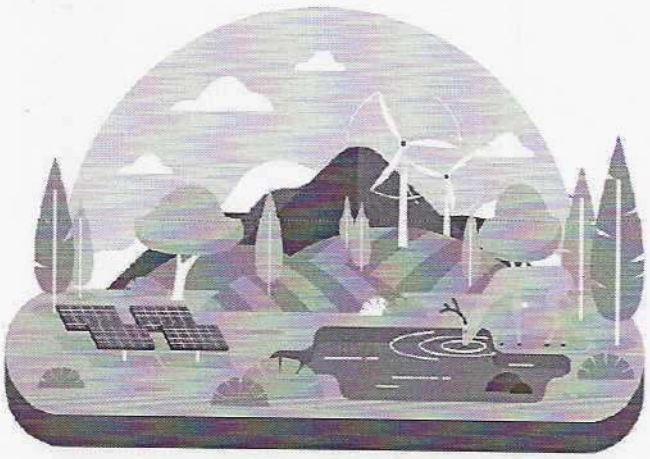
Through the green audit, a direction as how to improve the structure of environment and inclusion of several factors that can protect the environment can be commenced. This audit focuses on the Green Campus, Waste Management, Water Management, Air Pollution, Energy Management & Carbon Footprint etc. being implemented by the institution. The concepts, structure, objectives, methodology, tools of analysis, objectives of the audit as below:

INTRODUCTION

Now a days, the educational institutions are becoming more thoughtful towards the environmental aspects and as a result new and innovative concepts are being introduced to make them sustainable and eco-friendly. To preserve the environment within the institution, a number of viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the saving the energy, waste recycle, water consumption reduction, water harvesting and many more...

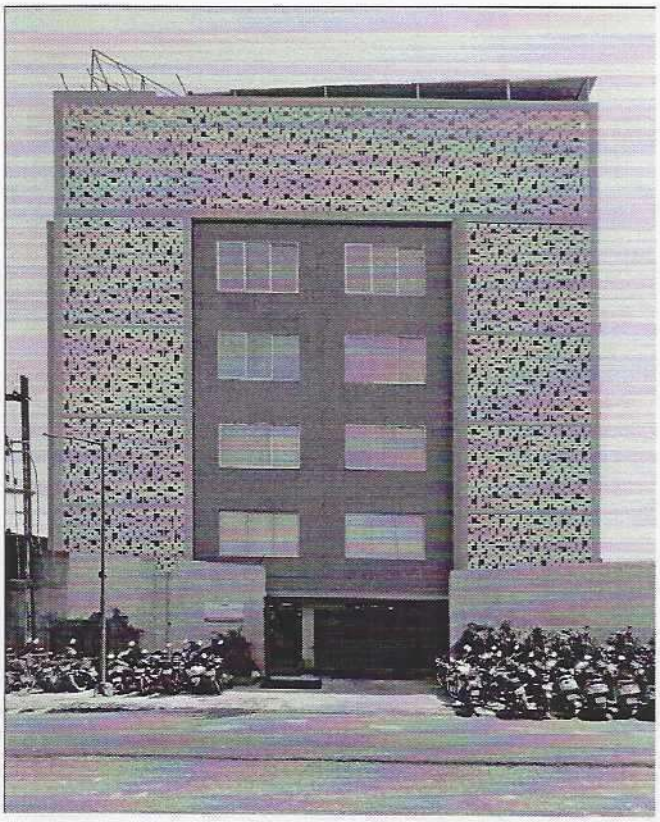
The activities carried out by the institution can also create adverse environmental impacts. Green audit is defined as an official inspection of the effects a college has on the environment. Green Audit is conducted to evaluate the actual scenario at the institution campus. Green audit can be a useful tool for a university /college to determine how and where they are using the most of the energy or water or resources; the institution can then decide how to implement changes and make savings. It can also be used to determine the nature and volume of waste, which can be used for a recycling project or to improve waste minimization plan.

Green auditing and the application of mitigation measures is a win-win situation for all the institutions, the learners and the mother earth. It can also result in health awareness and can promote the environmental awareness, values and beliefs. It provides a better understanding to staff and students about the Green impact on institution. Green auditing also upholds financial savings through reduction of resource usage. It gives an opportunity to the students and teachers for the development of ownership of the personal and social responsibility. The audit process involves primary data collection, site walk through with the team of university /college including the assessment of policies, activities, documents and records.



OVERVIEW OF THE COLLEGE

Our College is an affiliated to Patliputra University, Patna. It was established in the year 2001. The college possesses a campus of 1.07 acre with a student strength of 159 and 39 strong core faculty members along with visiting / guest faculties along with guest faculties located in the urban area of Patliputra Industrial area, Patna. The College was born out of a vision to address the critical need for qualified educators and to provide a platform for quality education. The founders envisioned an institution that would not only impart academic knowledge but also instill values of social responsibility, ethical conduct, and community service among its students.



As an institution of learning it has a commanding presence both in the University as well as in the capital of the state. The college while maintaining its exemplary record in University examinations.

MISSION

Our mission is to adapt to the evolving needs of society by focusing on the following key aims:

1. Skill Development: We are committed to enhancing the skills of unskilled and semi-skilled individuals, school and college dropouts, and underprivileged members of society. Through industrial training and a robust curriculum, we aim to enable them to achieve high performance.

2. Empowerment of Underprivileged Communities: Our focus is on providing affordable vocational education to weaker sections of society, particularly in the backward regions of eastern India. By implementing sound business and management practices, we aim to help individuals earn a sustainable livelihood, contributing to poverty alleviation.

3. Optimization of Human Potential: We strive to unlock the potential of people in eastern India, particularly in rural and semi-rural areas. By offering superior training solutions, we enhance their engagement in various vocations, fostering happiness and prosperity.

4. Compassionate Vocational Training: We actively serve the community by providing high-quality, compassionate livelihood training. Our goal is to make human resources more productive and proactive, empowering individuals to contribute meaningfully to society.

5. Youth Empowerment: We focus on preparing youth to become productive adults through entrepreneurship development, technology innovation, and skill education. By equipping them with essential knowledge and skills, we aim to improve their quality of life and that of their families and communities

VISION

Our vision is to maintain an unwavering commitment to the highest quality standards in education, continuously illuminating society with knowledge and innovation. In pursuit of this vision, we are dedicated to:

1. Value-Based Education: We strive to develop and promote a professional educational system grounded in strong values, fostering innovation at every level.

2. Knowledge Advancement: We are committed to keeping pace with the ever-expanding frontiers of knowledge, making significant contributions to the growth of an intellectually vibrant society through pioneering educational initiatives.

3. Inspirational Leadership: As a value-based organization, we aim to inspire leadership and satisfy intellectual curiosity. We embrace a progressive ethos rooted in humanistic traditions, community involvement, accountability, integrity, and respect for all.

By embodying these principles, we stand on the threshold of substantial growth, driven by our continuous commitment to excellence and our proven ability to deliver the best in education. Through this vision, we aspire to empower individuals and communities, shaping a brighter future for all.

AUDIT PARTICIPANTS

On behalf of Catalyst College, Patna

Name	Designation
Mr. Neeraj Agrawal	*Director*
Mr. Amit Shukla	*Audit Coordinator*
Dr. Pawan Kumar Jha	*Member*
Dr. Reena Prasad	*Member*
Mr. Ravi Kumar Soni	*Member*
Mr. Nitish Rohitgi	*Member*
Dr. Neeraj Poddar	*Member*

On behalf of Green India Mission

Name	Position	Qualifications
Dr. Arvind Kumar Singh	BEE & BIS Certified Auditor	*Ph. D, M. sc (Environment & Management)*
Dr. Shamin Ahmad	Co- Auditor	*M.Sc (Botany), Field Expert & Environmental Scientist.*

EXECUTIVE SUMMARY

Green auditing is an essential step to identify and determine whether the institutional practices are sustainable and ecological. Traditionally, we were upright and efficient users of natural resources. But over the period of time, excessive usage of resources like water, electricity, petrol, etc. have become habitual for everyone especially, in urban and semi-urban areas. It is actually the right time to check if we (our process) are consuming more than required resources? Whether we are using resources sensibly?

Green audit standardizes all such practices and provides an efficient way to use natural resources. In the time of climate change and resource exhaustion it is necessary to re-check the processes and convert then in to green and sustainable. Green audit provides an approach for the same. It also increases overall awareness among the folks working in institution towards the eco-friendly environment.

This is the First attempt to conduct green audit of this campus for fulfilment of NAAC criteria. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil, water usage, vegetation, waste management practices and carbon foot print of the campus. Initially a questionnaire was shared to know about the existing resources of the campus and resource consumption pattern of the students and staff in the campus.

GREEN AUDIT - ANALYSIS

GENERAL INFORMATION

1. Was any Green Audit conducted earlier?

Yes, This is the second external audit organized by the college.

2. What is the total strength (people count) of the Institute?

Students
Male: 135 *Female: 24* *Total: 159*

Teachers
Male: 27 *Female:12* *Total: 39*

Non-Teaching Staff
Male:17 *Female: 8* *Total: 25*

Technical staff
Male: 13 *Female: 2* *Total: 15*

Total Strength
Male :192 *Female: 46* *Total:238*

3. What is the total number of working days of your campus in a year?

There are one hundred and eighty working days in a year.

4. Where is the campus located?

The campus is located at PLOT NO. C16(P), INFRONT OF COCA COLA,PATLIPUTRA INDUSTRIAL AREA, PATNA - 800013, BIHAR

5. Which of the following are available in your institute?

Garden area	*Available*
Playground	*Available*
Kitchen	*Available*
Toilets	*Available*
Garbage Or Waste Store Yard	*Available*
Laboratory	*Available*

6. Which of the following are found near your institute?

Municipal dump yard	*Not in vicinity of institute*
Garbage heap	*No Garbage heaps*
Public convenience	*Public convenience is available*
Sewerline	*Approximately 100M sewer line within campus*
Stagnant water	*No stagnant water*
Open drainage	*No*

WASTE MINIMIZATION AND RECYCLING

1. Does your institute generate any waste? If so, what are they?

Yes, following waste are generated in campus

- *E-waste from Karo samvabh*
- *Solid waste*
- *Canteen waste*
- *Paper, plastic*
- *Horticulture waste*

2. What is the approximate amount of waste generated per day? (in Kg approx.)

Biodegradable waste – 1.6 Kg
Non-biodegradable waste -1.8 Kg Hazardous Waste- 300 gm

3. How is the waste managed in the Institute? By Composting, Recycling, Reusing, Others (specify)

- *Catalyst College is using providing segregated solid waste to municipal corporation*
- *The college is making efforts to transition to a paperless environment, adopting digitalization and reducing paper usage through various measures, such as digital storage, digital communication, and e-assignments.*
- *RO wastewater is used in washrooms*
- *Rain water harvesting pits are therefore ground water recharge.*

4. Do you use recycled paper in Institute?

Yes for file covers and internal assessments and also implemented Office Automation and Digitalization work

5. How would you spread the message of recycling to others in the community?

College is spreading the awareness about recycling through different activities and campaigns to students, staff and local nearby.

6. Can you achieve zero waste in your Institute? If yes, how?

College is following the five "R" principle of reduce, reuse, recycle, refuse and regenerate to obtain zero waste in campus.

GREENING THE CAMPUS

1. Is there a garden in your Institute?

Yes, about 235 Flower Pots are available as Garden.

2. Do students spend time in the garden?

No.

3. Total number of Plants in Campus?

Plant type with approx. count	
Full grown Trees	*01*
Small Trees	*11*

4. Is the College campus having any Horticulture Department? (If yes, give details)

No

5. How many Tree Plantation Drives organized by campus per annum?

06 Plantation Drive is carried out annually.Survival rate is more than 80%.and also participated in Jal Jiwan Harliyali

6. Is there any Plant Distribution Program for Students and Community?

College provides planters to all guests as a gift rather than a bouquet of flowers.

8. Is there any Plant Ownership Program?

Yes Birthday Plantations

GREEN INDIA MISSION ESTD 2017 PATNA (BIHAR)

WATER AND WASTEWATER MANAGEMENT

1. List uses of water in your institute

Basic use of water in campus:
Drinking – 94KL/month
Gardening – 10Kl/month
Kitchen and Toilets – 156KL/month
Others – 85 KL/month

2. How does your institute store water? Are there any water saving techniques followed in your institute?

College stores water in terrace tanks.

Saving Techniques

- *Avoid overflow of water-controlled valves are provided in water supply system.*
- *Close supervision for water supply system.*

3. Locate the point of entry of water and point of exit of waste water in your institute.

***Entry**- Water comes from Municipal corporation, borewell and through rain water harvesting*
***Exit**- From Canteen, Toilets, bathrooms and Labs through covered drainage which is connected to sewage line*

4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Water Conservation awareness for new students*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*
- *Use of sprinklers for gardening purpose to save water*
- *Push taps are installed to save water*
- *Re use wastewater created by a reverse osmosis (RO) system in washroom*

ANIMAL WELFARE

1. List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.)

No

2. Does your institute have a Biodiversity Program or a KARUNA CLUB?

*Yes, Catalyst College **Eco club** actively organizes awareness through various campaigns and activities including seminars, poster competition, etc.*

GREEN INITIATIVES

- There is ban on single-use plastic and plastic crockery in the campus.
- College has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- College has three types of containers for disposing the waste material – (i) Green Color for Wet organic waste material, (ii)Blue Color for dry waste material, (iii) Red Color for Hazardous Waste (Electronic waste).
- Solar panels (05kWp) have been installed in the campus.
- Installation of rain water harvesting systems in campus building.
- **Green India Mission** initiative by the college.
- The college is actively engaged with the Green India Mission.
- Students are involved in 'Best out of waste projects ' such as paper- bagmaking, card board dustbin making etc. for recycling of waste materials. Old newspapers, magazines, answer books etc. are periodically sold to recycling agents.
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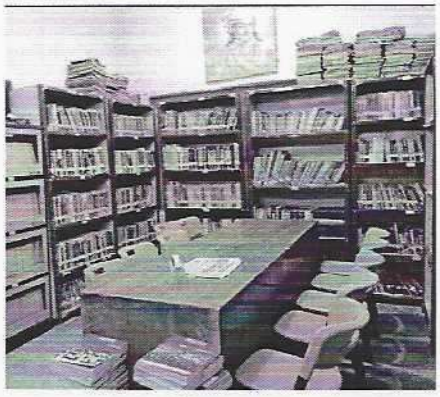

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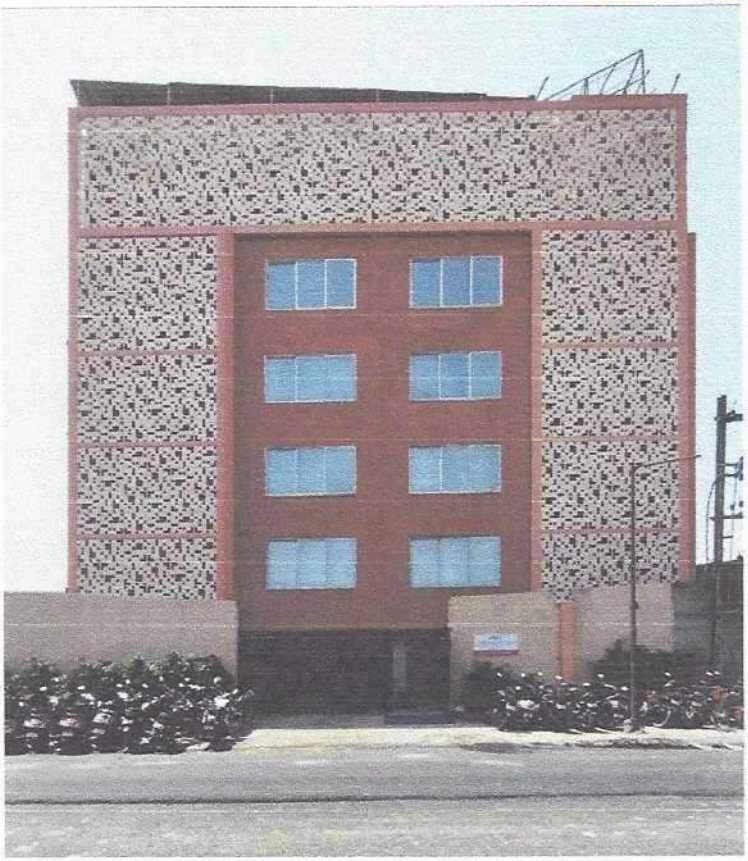

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28/11/24

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Senior Auditor
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Green India Mission associate with Ayan Enterprises, Patna
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Branch Office : 392A Sultanganj, Mahendru, Patna – 800006, Bihar
E-mail : greenim@gmail.com logon : www.greenim.org

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Through the green audit, a direction as how to improve the structure of environment and inclusion of several factors that can protect the environment can be commenced. This audit focuses on the Green Campus, Waste Management, Water Management, Air Pollution, Energy Management & Carbon Footprint etc. being implemented by the institution. The concepts, structure, objectives, methodology, tools of analysis, objectives of the audit as below:

INTRODUCTION

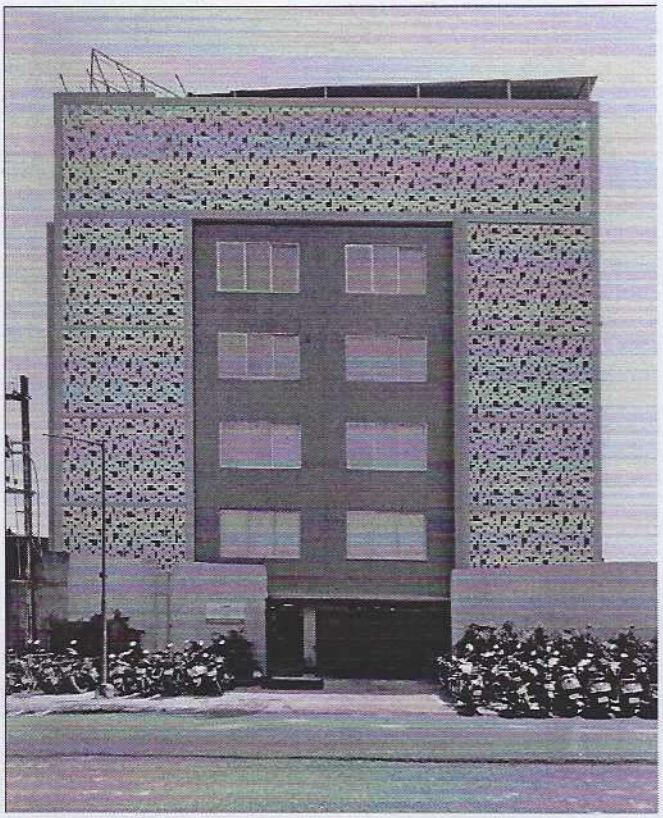
Now a days, the educational institutions are becoming more thoughtful towards the environmental aspects and as a result new and innovative concepts are being introduced to make them sustainable and eco-friendly. To preserve the environment within the institution, a number of viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the saving the energy, waste recycle, water consumption reduction, water harvesting and many more...

The activities carried out by the institution can also create adverse environmental impacts. Green audit is defined as an official inspection of the effects a college has on the environment. Green Audit is conducted to evaluate the actual scenario at the institution campus. Green audit can be a useful tool for a university /college to determine how and where they are using the most of the energy or water or resources; the institution can then decide how to implement changes and make savings. It can also be used to determine the nature and volume of waste, which can be used for a recycling project or to improve waste minimization plan.

Green auditing and the application of mitigation measures is a win-win situation for all the institutions, the learners and the mother earth. It can also result in health awareness and can promote the environmental awareness, values and beliefs. It provides a better understanding to staff and students about the Green impact on institution. Green auditing also upholds financial savings through reduction of resource usage. It gives an opportunity to the students and teachers for the development of ownership of the personal and social responsibility. The audit process involves primary data collection, site walk through with the team of university /college including the assessment of policies, activities, documents and records.

OVERVIEW OF THE COLLEGE

The College is an affiliated to Patliputra University, Patna. It was established in the year 2001. The college possesses a campus of 1.07 acre with a student strength of 349 and 48 strong core faculty members along with visiting / guest faculties along with guest faculties located in the urban area of Patliputra Industrial area, Patna. The College was born out of a vision to address the critical need for qualified educators and to provide a platform for quality education. The founders envisioned an institution that would not only impart academic knowledge but also instill values of social responsibility, ethical conduct, and community service among its students.



As an institution of learning it has a commanding presence both in the University as well as in the capital of the state. The college while maintaining its exemplary record in University examinations.

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Our mission is to adapt to the evolving needs of society by focusing on the following key aims:

1. Skill Development: We are committed to enhancing the skills of unskilled and semi-skilled individuals, school and college dropouts, and underprivileged members of society. Through industrial training and a robust curriculum, we aim to enable them to achieve high performance.

2. Empowerment of Underprivileged Communities: Our focus is on providing affordable vocational education to weaker sections of society, particularly in the backward regions of eastern India. By implementing sound business and management practices, we aim to help individuals earn a sustainable livelihood, contributing to poverty alleviation.

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By embodying these principles, we stand on the threshold of substantial growth, driven by our continuous commitment to excellence and our proven ability to deliver the best in education. Through this vision, we aspire to empower individuals and communities, shaping a brighter future for all.

GREEN INDIA MISSION ESTD 2017 PATNA (BIHAR)

AUDIT PARTICIPANTS

On behalf of Catalyst College, Patna

Name	Designation
Mr. Neeraj Agrawal	*Principal*
Mr. Amit Shukla	*Audit Coordinator*
Dr. Neeraj Poddar	*Member*
Mr. Nitish Rohitgi	*Member*
Dr. Pawan Kumar Jha	*Member*
Dr. Reena Prasad	*Member*
Mr. Ravi Kumar Soni	*Member*

On behalf of Green India Mission

Name	Position	Qualifications
Dr. Arvind Kumar Singh	BEE & BIS Certified Auditor	*Ph. D, M. sc (Environment & Management)*
Dr. Shamin Ahmad	Co- Auditor	*M.Sc (Botany), Field Expert & Environmental Scientist.*

EXECUTIVE SUMMARY

Green auditing is an essential step to identify and determine whether the institutional practices are sustainable and ecological. Traditionally, we were upright and efficient users of natural resources. But over the period of time, excessive usage of resources like water, electricity, petrol, etc. have become habitual for everyone especially, in urban and semi-urban areas. It is actually the right time to check if we (our process) are consuming more than required resources? Whether we are using resources sensibly?

Green audit standardizes all such practices and provides an efficient way to use natural resources. In the time of climate change and resource exhaustion it is necessary to re-check the processes and convert then in to green and sustainable. Green audit provides an approach for the same. It also increases overall awareness among the folks working in institution towards the eco-friendly environment.

This is the second attempt to conduct green audit of this campus for fulfilment of NAAC criteria. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil, water usage, vegetation, waste management practices and carbon foot print of the campus. Initially a questionnaire was shared to know about the existing resources of the campus and resource consumption pattern of the students and staff in the campus.

GREEN AUDIT - ANALYSIS

GENERAL INFORMATION

1. **Was any Green Audit conducted earlier?**

yes, this is the third external audit organized by the College

2. **What is the total strength (people count) of the Institute?**

Students
Male: 285 Female: 64 Total: 349

Teachers
Male: 33 Female: 15 Total: 48

Non-Teaching Staff
Male:17 Female: 8 Total: 25

Technical staff
Male: 13 Female: 2 Total: 15

Total Strength
Male : 348 Female: 89 Total: 437

3. **What is the total number of working days of your campus in a year?**

There are one hundred and eighty working days in a year.

4. **Where is the campus located?**

The campus is located at Plot No. C16(P), Infront Of Coca Cola,Patliputra Industrial Area, Patna - 800013, Bihar

5. **Which of the following are available in your institute?**

Garden area	*Available*
Playground	*Available*
Kitchen	*Available*
Toilets	*Available*
Garbage Or Waste Store Yard	*Available*
Laboratory	*Available*

6. Which of the following are found near your institute?

Municipal dump yard	*Not in vicinity of institute*
Garbage heap	*No Garbage heaps*
Public convenience	*Public convenience is available*
Sewerline	*Approximately 500M sewer line within campus*
Stagnant water	*No stagnant water*
Open drainage	*No*

WASTE MINIMIZATION AND RECYCLING

1. Does your institute generate any waste? If so, what are they?

Yes, following waste are generated in campus

- *E-waste from Karo samvabh*
- *Solid waste*
- *Canteen waste*
- *Paper, plastic*
- *Horticulture waste*
- *Laboratories waste*

2. What is the approximate amount of waste generated per day? (in Kg approx.)

Biodegradable waste – 1.6 Kg
Non-biodegradable waste -1.8 Kg
Hazardous Waste- 300 gm

3. How is the waste managed in the Institute? By Composting, Recycling, Reusing, Others (specify)

- *Catalyst College is using providing segregated solid waste to municipal corporation*
- *The college is making efforts to transition to a paperless environment, adopting digitalization and reducing paper usage through various measures, such as digital storage, digital communication, and e-assignments.*
- *RO wastewater is used in washrooms*
- *Rain water harvesting pits are therefore ground water recharge.*

4. Do you use recycled paper in Institute?

Yes for file covers and internal assessments and also implemented Office Automation and Digitalization work

5. How would you spread the message of recycling to others in the community?

College is spreading the awareness about recycling through different activities and campaigns to students, staff and local nearby.

6. Can you achieve zero waste in your Institute? If yes, how?

College is following the five "R" principle of reduce, reuse, recycle, refuse and regenerate to obtain zero waste in campus and also collaboration with Trivikram Empowerment, Patna

GREENING THE CAMPUS

1. Is there a garden in your Institute?

Yes, about 235 Flower Pots are available as Gardens.

2. Do students spend time in the garden?

NO

3. Total number of Plants in Campus?

Plant type with approx. count

Full grown Trees	*01*
Small Trees	*11*

4. Is the College campus having any Horticulture Department? (If yes, give details)

NO

5. How many Tree Plantation Drives organized by campus per annum?

06 Plantation Drive is carried out annually.Survival rate is more than 80%.andalso participated in Jal Jiwan Harliyali

6. Is there any Plant Distribution Program for Students and Community?

College provides planters to all guests as a gift rather than a bouquet of flowers.

8. Is there any Plant Ownership Program?

Yes Birthday Plantations

WATER AND WASTEWATER MANAGEMENT

1. List uses of water in your institute

Basic use of water in campus:
Drinking – 94KL/month
Gardening – 10Kl/month
Kitchen and Toilets – 156KL/month
Others – 85 KL/month

2. How does your institute store water? Are there any water saving techniques followed in your institute?

College stores water in terrace tanks.

Saving Techniques

- *Avoid overflow of water-controlled valves are provided in water supply system.*
- *Close supervision for water supply system.*

3. Locate the point of entry of water and point of exit of waste water in your institute.

***Entry**- Water comes from Municipal corporation, borewell and through rain water harvesting*
***Exit**- From Canteen, Toilets, bathrooms and Labs through covered drainage which is connected to sewage line*

4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Water Conservation awareness for new students*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*
- *Use of sprinklers for gardening purpose to save water*
- *Push taps are installed to save water*
- *Re use wastewater created by a reverse osmosis (RO) system in washroom*

ANIMAL WELFARE

1. List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.)

No.

2. Does your institute have a Biodiversity Program or a KARUNA CLUB?

*Yes, Catalyst College **Eco club** actively organizes awareness through various campaigns and activities including seminars, poster competition, etc.*

GREEN INDIA MISSION ESTD-2017 PATNA (BIHAR) NGO

GREEN INITIATIVES

- There is ban on single-use plastic and plastic crockery in the campus.
- College has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- College has three types of containers for disposing the waste material – (i) Green Color for Wet organic waste material, (ii)Blue Color for dry waste material, (iii) Red Color for Hazardous Waste (Electronic waste).
- Solar panels (05kWp) have been installed in the campus.
- Installation of rain water harvesting systems in campus building.
- **Green India Mission** initiative by the college.
- The college is actively engaged with the Green India Mission.
- Students are involved in 'Best out of waste projects ' such as paper- bagmaking, card board dustbin making etc. for recycling of waste materials. Old newspapers, magazines, answer books etc. are periodically sold to recycling agents.
- The college carries out various awareness campaigns, seminars, workshops, and interactive sessions to engage the campus community in the implementation of its Green Campus, Energy, and Environment policies.
- Vermicompost pit is present near the Herbal Garden which effectively uses organic plant waste to produce manure that is then used in the college gardens.
- The college is actively coordinating cleanliness activities within and beyond the campus, aligning with the vision of the Swachh Bharat Abhiyan. This includes raising awareness about cleanliness and hygiene through regular drives, rallies, and the active participation of students and staff in cleanliness efforts.

RECOMMENDATIONS

- Green building guidelines for future expansion projects of the campus.
- Environmental parameters shall be included in the purchase policy to achieve a cradle-to-grave approach for sustainability.
- Increase plantation drives in nearby, local bodies, NGOs and Municipal Corporations to balance the carbon emission and absorption.
- Arrange training programs on environmental management systems and nature conservation for schools and local people.
- Increase in Environmental promotional activities for spreading awareness at the campus.
- Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other materials for needy students. This can be an initiative under the green program.
- Regular workshops related to Plastic free campus, plantation drives, 3R implementation, e-waste collection, menstrual hygiene, etc. should be carried out.
- Messages should be displayed at various locations to Aware the People about Energy Savings

CONCLUSION

This audit involves considerable team discussions and meetings with key staff members on a variety of environmental-related topics. The eco club of the College promotes conservation of resources.

Overall 05% of The College is for landscaping. The college makes a significant effort to act in an environmentally responsible manner and takes into account the environmental effects of the majority of its activities. The recommendations in this report suggests some more ways in which the college can work to improve its practices and develop in to a more sustainable institution.

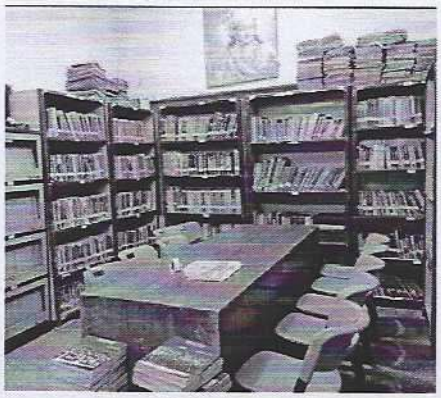
It's important to begin a few things, such as initiating drip irrigation and conservation awareness message display at different locations in campus. Additionally, we strongly advise to increase awareness amongst the students, staff and local societies for 3R principle and conservation of water and energy.

REFERENCE

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- The Petroleum Act: 1934 – The Petroleum Rules: 2002
- The Central Motor Vehicle Act: 1988 (Amended 2011) and The Central Motor Vehicle
- Rules:1989 (Amended in 2005)
- Energy Conservation Act 2010.
- The Water [Prevention & Control Of Pollution] Act – 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules – 1975
- The Air [Prevention & Control Of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- The Gas Cylinders Rules – 2016 (Replaces the Gas Cylinder Rules – 1981
- E-waste management rules 2016
- Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended 2006)
- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)
- The Batteries (Management and Handling) rules, 2001 (Amended 2010)
- Relevant Indian Standard Code practices

ANNEXURE I–ENVIRONMENT CONSCIOUSNESS PHOTOS

Green Flower Pots

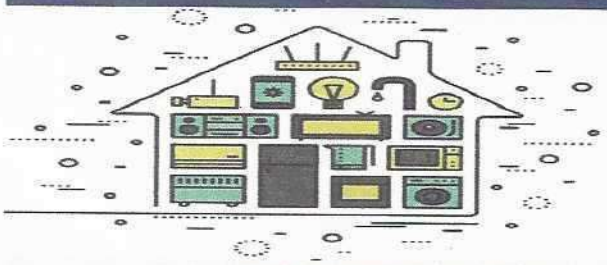


Library

Smart Classroom

Computer Lab

********** END OF THE REPORT **********



Energy Audit

ENERGY AUDIT REPORT

2020-21

PREPARED BY
GREEN INDIA MISSION, PATNA
IN ASSOCIATION WITH AYAN ENTERPRISES, PATNA

GREEN INDIA MISSION • PATNA (BIHAR) • ESTD 2017

Catalyst College

(A Unit of Vijayam Education, Patna, Bihar)
Affiliated to Patliputra University, Patna Bihar

Email : info@catalystcollege.in Contact No.9835024444
Logon : www.catalystcollege.in
Address : PLOT NO. C16(P), INFRONT OF COCA COLA, PATLIPUTRA INDUSTRIAL AREA, PATNA - 800013, BIHAR

TABLE OF CONTENT

GREEN INDIA MISSION * ESTD-2017 * PATNA (BIHAR) *

ACKNOWLEDGEMENT

Green India Mission, Patna would like to thank the management of Catalyst College, Patna for assigning this important work of Energy Audit. We appreciate the co-operation to the teams for completion of assessment.

First of all, we would like to thank ***Mr. Neeraj Agrawal – Principal and Mr. Amit Shukla, IQAC Co-Ordinator*** for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank ***Mr.Amit Shukla Audit Co-ordinator***, for his/her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

1. ***Dr.Neeraj Poddar***
2. ***Nitish Rohitgi***
3. ***Dr.Pawan Kumar Jha***
4. ***Dr.Reena Prasad***
5. ***Ravi Kumar Soni***

GREEN INDIA MISSION * ESTD 2017 * PATNA (BIHAR) *

General Secretary
Green India Mission
Patna (Bihar) 08/07/2021

Dr. Arvind Kumar Singh
BEE & BIS Certified Auditor
ID No.EM-7059/2017 SIM-14595

General Secretary
Green India Mission, Patna

Registration No. 10314/2017

Green India Mission

let's go green planet

(A Unit of Ayan Enterprises, Patna)

Audit Certificate

Catalyst College, Patna

Plot No. C16 (P), Patliputra Industrial Area, Patna - 800013, Bihar

Has been assessed by Green India Mission, Patna for the comprehensive study of Energy Audit on institutional working framework to fulfill the requirement of

ENERGY AUDIT

ACADEMIC YEAR 2020-21

The energy-saving initiatives carried out by the institution have been verified in the report submitted and were found to be satisfactory.

The efforts taken by the management and the faculty towards all type of energy used in the institution and sustainability are appreciated and noteworthy.

The institution is credited score 8.12/10 Certificate No. GIM/ERA/19/2020-21

Principal
CATALYST COLLEGE
Plot No.- C-16(P) Patliputra Industrial Area
Patliputra, Patna-13

Senior Auditor
Green India Mission

President
Green India Mission

General Secretary
Green India Mission

Green India Mission associate with Ayan Enterprises, Patna
Head Office: 27/393A, Trilokpuri, Mayur Vihar Phase I, New Delhi – 110091
Branch Office : 392A Sultanganj, Mahendru, Patna – 800006, Bihar
E-mail : greenim@gmail.com logon : www.greenim.org

DISCLAIMER

Green India Mission Energy Audit Team has prepared this report for Catalyst College, Patna based on data submitted by the representatives of college complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

If you wish to distribute copies of this report to external parties of your organisation, then all pages must beincluded.

Green India Mission, its staff and agents shall keep confidential all the information relating to your organization and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies.

Green India Mission staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

08.02.21

GREEN INDIA MISSION * PATNA (BIHAR) * ESTD.2017

Dr. Arvind Kumar Singh
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ID No.EM-7059/2017 SIM-14595

General Secretary
Green India Mission
Patna (Bihar)
08/02/2021.

General Secretary
Green India Mission, Patna

ABBREVIATION

A	Amps
AC	Air Conditioner
AC	Alternating Current
AMET	Academy of Maritime Education and Training
CFL	Compact fluorescent lamp
CIP	Comprehensive Inspection Programme
DC	Direct Current
HSD	High Speed Diesel
Hz	Hertz
kg	Kilogram
kVA	kilo-volt-ampere
kW	kilo Watts
kWh	kilowatt hour
kWp	Kilowatt peak
LED	Light Emitting Diode
LPG	Liquefied Petroleum Gas
MMS	Module mounting structure
MPPT	Maximum Power Point Tracker
NAAC	The National Assessment and Accreditation Council
SEC	Specific Energy Consumption
SPV	Solar Photovoltaic
STC	Standard Test Condition
TV	Television
V	Volts
W	Watts
W/m2	watt per square metre

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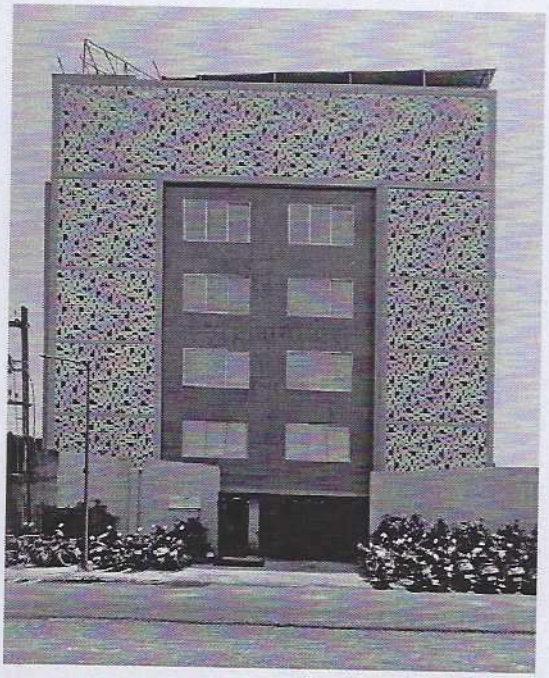

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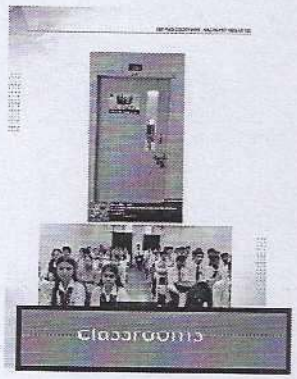


GREEN INDIA MISSION * PATNA (BIHAR) * EST.-2017

AUDIT PARTICIPANTS

On behalf of College Administration

Name	Designation
Mr. Neeraj Agrawal	*Principal*
Mr. Amit Shukla	*IQAC Coordinator*
Dr.Pawan Kumar Jha	*Member*
Dr.Neeraj Poddar	*Member*
Dr.Reena Prasad	*Member*
Ravi Kumar Soni	*Member*
Nitish Rohitgi	*Member*

On behalf of Green India Mission

Name	Position	Qualifications
Dr.Arvind Kumar Singh	**BEE & BIS Certified Auditor**	*Ph.D.,MSc.(Environment & Management)*
Dr. Mirza H. Abbas	**Co-Auditor**	M.Sc(Physics), Field Expert

EXECUTIVE SUMMARY

The purpose of this Energy Audit was to seek opportunities to improve the energy efficiency of the Catalyst College . Reducing the energy consumption despite improving the human comfort, health and safety were of primary concern.

Beyond just identifying the energy consumption pattern, this audit sought to detect and categorize the most energy efficient appliances. Additionally, some daily practices relating common appliances have been shared which may help reducing the energy consumption. Data collection for energy audit of the campus was carried out by the AYAN ENTERPRISES Team. The Energy Audit Report accounts for the energy consumption patterns of the institution on actual survey and detailed analysis during the audit.

The work comprehends the area wise consumption computed using suitable equipment. The analysis was carried out by our team with the support of the staff members from Catalyst College.The report provides a list of possible actions to preserve and efficiently access the available source, resources and their saving potential was also identified. We look forward towards optimization

that the authorities, students and staff members would follow the recommendations in the best possible way. The report is based on certain generalizations including the approximations wherever necessary. The views conveyed may not reveal the general opinion. They merely represent the opinion of the team guided by the interviews of clients. We are happy to submit this Energy audit report to the Catalyst College.

ENERGY AUDIT - ANALYSIS

1. ENERGY CONSUMPTION

To understand the Energy Consumption trends and to analyze the average monthly consumption we have collected electricity energy bills from July 2023 to June 2024

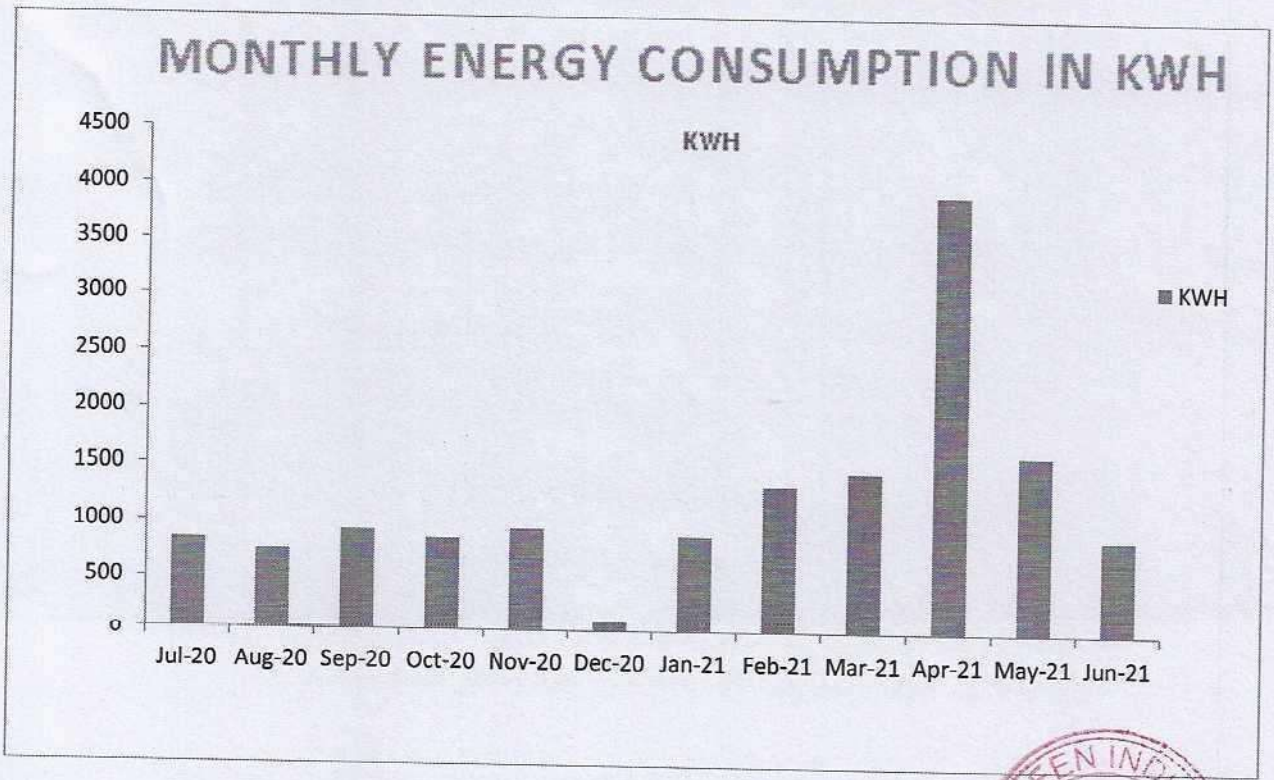
The details of **"Meter Connection"** at **"Catalyst College"** are as follows-

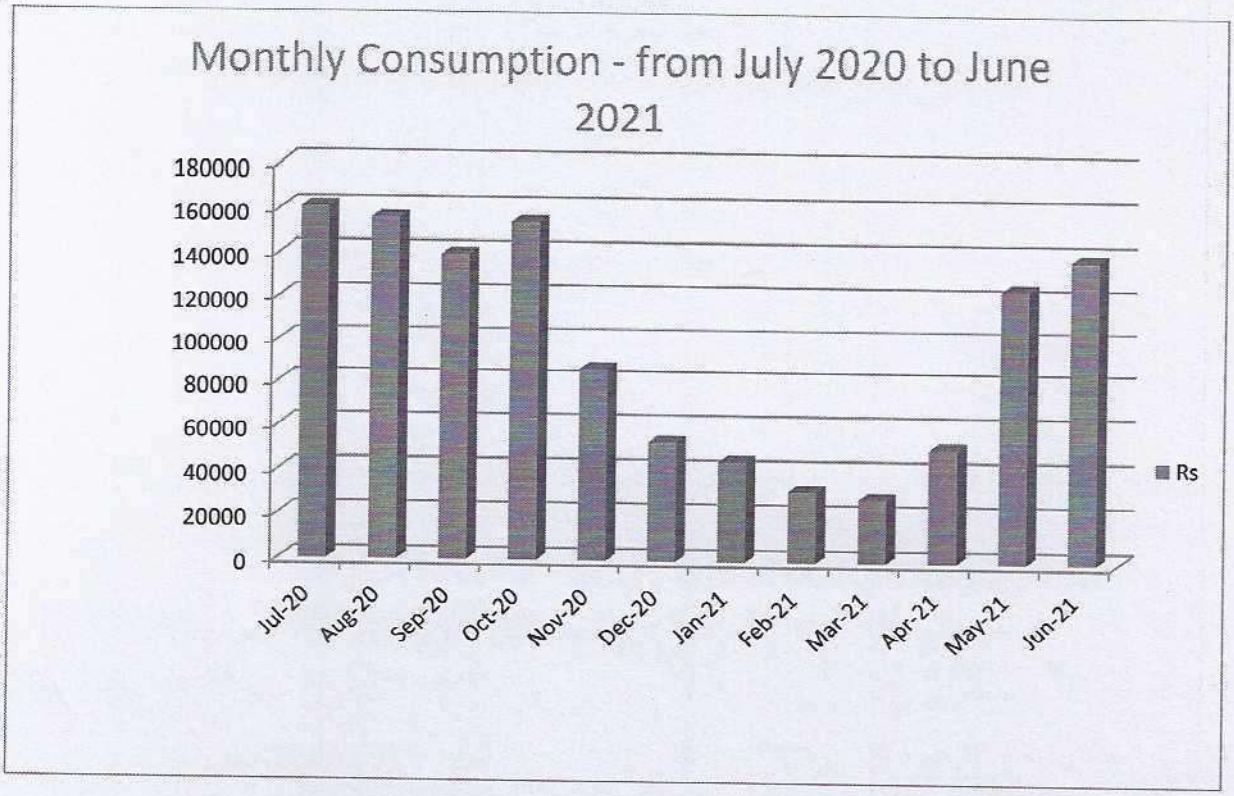
Name	-	SRI VIJAYAM EDUCATIONALS TRUST
CA No.	-	102381540

1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

To understand the Energy consumption trend and to develop the baseline parameter we have collected monthly energy bills for the 12 months i.e. from July 2020 to June 2021.

Month	Solar PV	CA No. 101842894 Total Readings	Rate INR	Amount in INR
Jul-20	5000	845	8.30	7013.5
Aug-20	5000	755	8.30	6266.5
Sep-20	5000	930	8.30	7719
Oct-20	5000	855	8.30	7096.5
Nov-20	5000	945	8.30	7843.5
Dec-20	5000	81	8.30	672.3
Jan-21	5000	893	8.30	7411.9
Feb-21	5000	1348	8.30	11188.4
Mar-21	5000	1467	8.30	12176.1
Apr-21	5000	3918	8.30	32519.4
May-21	5000	1620	8.30	13446
Jun-21	5000	893	8.30	7411.9
Total	**60000**	**14550**		**120765**





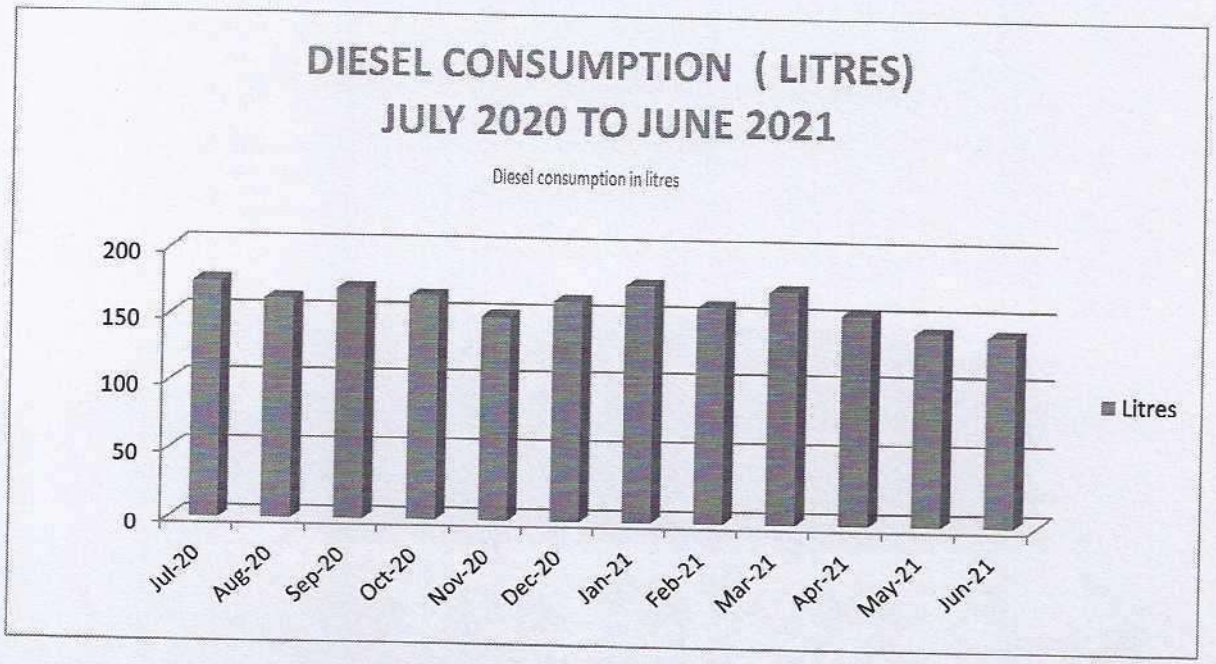
	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
Rs	7013.5	6266.5	7719	7096.5	7843.5	672.3	7411.9	11188.4	12176.1	32519.4	13446	7411.9

2. DIESEL CONSUMPTION

Below is the diesel consumption details in liters from July 2020 to June 2021.

Period	Diesel consumption (in liters)
Jul-20	175
Aug-20	162
Sep-20	170
Oct-20	165
Nov-20	150
Dec-20	102
Jan-21	175
Feb-21	159
Mar-21	172
Apr-21	155
May-21	142
Jun-21	140
Total	1778

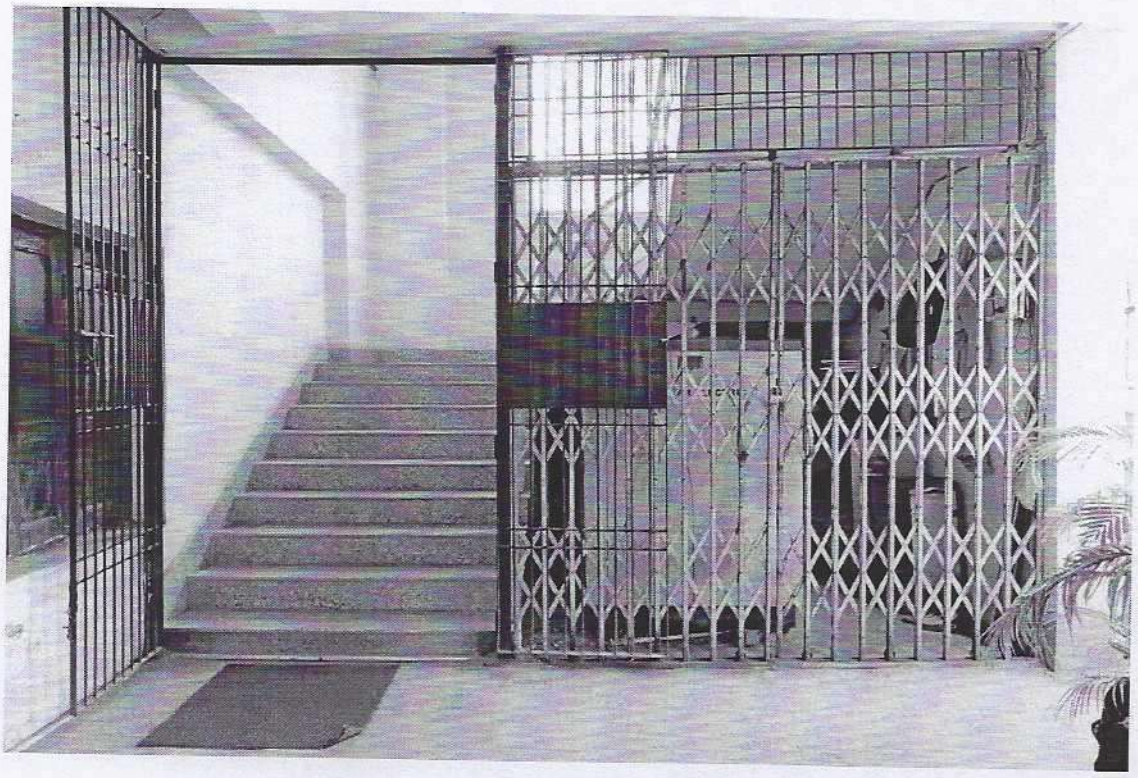
Note: College doesn't have records of monthly diesel consumption, so average value has been taken based on college's representative suggestion



3. ANALYSIS OF DG SETS

In the campus, there are one Diesel Generator (DG) set for its electrical power needs in caseof Grid power failure. DG set capacity is 62.5 kVA.

DG Set Design Details		
Description	*Unit*	*DG at Station*
Rated capacity	kVA	62.5
Hz		50
Sl No.		4R1040-T
Make		Kirloskar
Rated Power	kW	62
PF		0.8 Cos f
Phase		03
Noise Limit		75 db
Amps	Amps	87.5
Mfg.		2007



DG Set Operation details		
Operating hours during testing	Hours	0.50
% Loading	%	66.54
Energy Generation	kWh	33.86
Load	kVA	93.65
Fuel consumption during testing	Litre	06
Specific energy generation	kWh/litre	3.17

Observation and Suggestions:-

Soundproof silent generators are an efficient tool to keep both noise and vibration at low levels. For this purpose the power backup of the institution, the soundproof model is installed.

As per the trial taken during the energy audit the percentage loading of DG set is 66.54% which is ok and specific energy consumption of DG Sets 3.17 kWh/Litre which is satisfactory because as per manufacturer recommendation, best practices for SEC in DG sets range from 3.0 to 3.5 kWh/Litre and above.

We recommend college to initiate periodic maintenance schedule and monitoring of DG set through authorized lab.

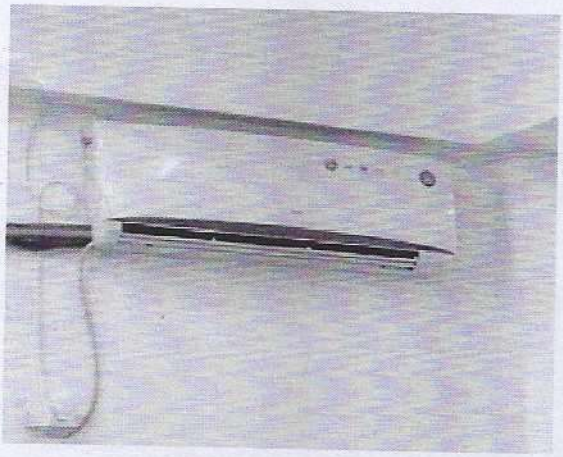
4. AC SYSTEM

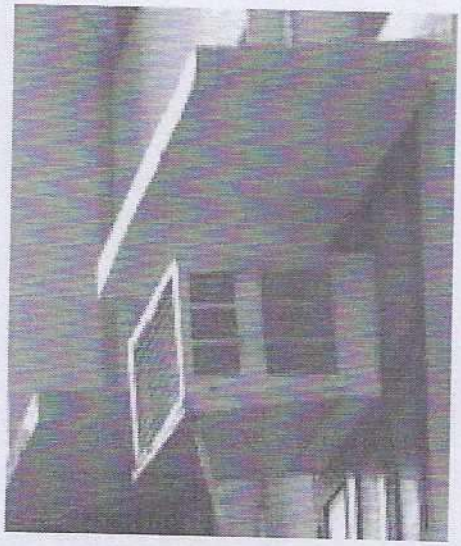
Energy Efficiency Ratio (EER): Performance of smaller chillers and ground floor units is frequently measured in EER rather than kW/ton. EER is calculated by dividing a chiller's cooling capacity (in Btu/h) by its power input (in watts) at full-load conditions.

There are 03 ACs installed in Catalyst College in various areas of various capacity the detail is given below:-

Location	Number of AC
Principal chamber	01
Staff room	02
Administrative Block Ground	01
Total	**04**

Remarks: - We have checked Energy Efficiency Ratio of AC's and EER of AC's is fairly OK. But in future you should purchase 3-Star rated inverter based split AC's because power consumption of Inverter based BEE 3-Star rated AC's is less than non-star rated AC's.





We recommend Catalyst College to organize periodic maintenance schedule and take corrective actions for insulating of AC's refrigerant lines in order to protect energy losses.

5. FANS ANALYSIS

In the Catalyst College, there are 106 fans installed. The observation and suggestionare given below.

Fans wattage	Count
Ceiling Fan-	106
Bulb Led	339
Tube light	94
Total	**539**

Observation and Suggestions:-

In the college, all the ceiling fans are of 60 W but BEE 5 Star Rated of 30W Ceiling Fans are present in the market. We recommend replacement to BEE 5 Star rated 30W fans.

Note:- Energy saving will increase or decrease if operating hours of machine /equipment will be increased or decreased and payback period will also increase or decrease if cost of investment (Cost of machine/equipment/accessories of machine) will increase or decrease because cost of investment is taken on tentative basis.

Lights type (based on wattage)	Count
18W LED Light	60
12 W LED Round	25
36W LED	100
36W Tube light	90
Total	**275**

Lux Measurement

Description	Lux	Remark
Class Rooms	120 to 235	Acceptable
Offices	130 to 240	Acceptable
Corridors	35 to 90	Acceptable
Washrooms	45 to 70	Acceptable
Outdoor	36 to 95	Acceptable
Computer Lab	150 to 289	Acceptable
Parking area	45 to 94	Acceptable
Canteen	69 to 185	Acceptable

Observation

College has initiated LED based lighting solution, but still there are 100 (36W) tube lights. LEDs save energy, the life span is much greater and emit virtually no heat. We recommend to replace the tube lights with LEDs.

Additionally, we recommend to install motion sensor-based lights in common areas such as library, washrooms, corridors, etc.

We also recommend to use solar lights for open areas like parking, ground, street lights, etc. Table below shows the performance characteristics comparison of all luminaries.

Table - Luminous Performance Characteristics of Commonly Used Luminaries

Type of Lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life
	Range	Avg.			
Incandescent	8-18	14	Excellent (100)	Homes, restaurants, general lighting emergency lighting	1000
Fluorescent lamps	46-60	50	Good w.r.t coating (67-77)	Offices, shops, hospitals, homes	5000
Compact fluorescent Lamps (CFL)	40-70	60	Very Good (85)	Hotels, shops, homes, offices	8000-10000
High pressure mercury (HPMV)	44-57	50	Fair (45)	General lighting in factories, garages, car parking. flood lighting	5000
Halogen lamps	18-24	22	Excellent (100)	Display, flood lightening, stadiumexhibition grounds, construction areas	2000 - 4000
High pressure sodium (HPSV) SON	67-121	90	Fair (22)	General lighting in ware houses, factories, street lighting	6000 - 12000
Low pressure sodium (LPSV) SOX	101-175	150	Poor (10)	Roadways, tunnels, canals, street lighting	6000 - 12000
Metal halide lamps	75-125	100	Good (70)	Industrial bays, spot lighting. flood lighting, retail stores	8000
LED Lamps	30-50	40	Good (70)	Reading lights, desk lamps, night lights, spotlights, security light signage lights, etc.	40000 - 100000

6. OTHER POWER CONSUMPTION

Inventory of IT Infrastructure

Device Type	Count
Printer 1500W	04
Computer 500W	161
Camera	52
Telephone	01
Inverter 1000W	02
Interactive Board	01
Projector	01
Hot Air Oven	01
Podium	01
Total	**224**

Water pump details

Sr. No.	Description	Unit	Pump No.-1
1	Rated Power of Motor	KW	1 HP
2	Motor Eff.	%	0.8
3	Discharge Head	m	70
4	Suction Head	m	650
5	Pump Type	Type	Submersible

Exhaust fan details

Device Type	Count
Air Purifier/ Cooler	1/1
Water Purifier/ Water Cooler	2/2
Refrigerator 1000w	02
60w Exhaust Fan	01
Total	09

ANALYSIS

There should be regular maintenance schedule of equipment like pumps, exhaust fans and IT equipment. Electronics such as computers, printers, scanners, etc. more than 3 year or 5 years (as per their life) should be replaced with new computers/laptops. Ideal Temperature should be maintained for all electronic appliances.

***** **END OF THE REPORT** *****

CATALYST COLLEGE

ENVIRONMENT AUDIT REPORT

2021-22

PREPARED BY
GREEN INDIA MISSION
IN ASSOCIATION WITH AYAN ENTERPRISES

Table of content

ACKNOWLEDGEMENT

GREEN INDIA MISSION would like to thank the management of Catalyst College, Patna for assigning this important work of Environment Audit. We appreciate the co-operation to the teams for completion of assessment.

First of all, we would like to thank *Neeraj Agrawal-Principal* for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank Amit Shukla - Audit Coordinator, for her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

1. *Dr.Neeraj Poddar*
2. *Mr. Nitish Rohitgi*
3. *Dr.Pawan Kumar Jha*
4. *Dr.Reena Prasad*
5. *Mr. Ravi Kumar Soni*

Dr. Arvind Kumar Singh
BEE & BIS Certified Auditor
ID No.EM-7059/2017 SIM-14595

GREEN INDIA MISSION EST. 2017 PATNA (BIHAR)

14/03/2022

General Secretary
Green India Mission
Patna (Bihar)

DISCLAIMER

GREEN INDIA MISSION Audit Team has prepared this report for Catalyst College based on input data submitted by the representatives of College complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information provided.

It is further informed that the conclusions are arrived at following best estimates and no representation, warranty or undertaking, express or implied is made available and no responsibility and liability is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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Dr. Arvind Kumar Singh
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GREEN INDIA MISSION ESTD 2017 PATNA (BIHAR)

14/03/2022
General Secretary
Green India Mission
General Secretary
Patna (Bihar)
Green India Mission, Patna

CONCEPT AND CONTEXT

Environment Protection Act, 1986 by the Ministry of Environment of forests on 13th march, 1992. As per this act, every person owning an industry or performing an operation or process needs a legal consent and must submit an environmental report or statement.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the sustainable environment.

In view of the NAAC circular regarding environment audit, the College management decided to conduct an external environment assessment study by a competent external professional auditor.

The term 'Environmental audit' means differently to different people. Terms like 'assessment', 'survey' and 'review' are also used to describe similar activities. Furthermore, some organizations believe that an 'environmental audit' addresses only environmental matters, whereas others use the term to mean an audit of health, safety and environment-related matters. Although there is no universal definition of Environment Audit, many leading companies/institutions follow the basic philosophy and approach summarized by the broad definition adopted by the International Chambers of Commerce (ICC) in its publication of Environmental Auditing (1989).

The ICC defines Environmental Auditing as:

"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects."

This audit focuses on the environment legal compliances and implementation of rules defined by MOEFCC or state pollution control board. The concepts, structure, objectives, methodology, tools of analysis, and objectives of the audit are discussed below.

INTRODUCTION

Nature is God gifted precious gift for all of us. Disturbance in the nature causes environmental Problems. These are increasing day by day as a result of development of urbanization and industrialization on earth. Because of unplanned utilization of resources, our planet is facing tremendous pressure results a sharp rise in temperature. Therefore, there is an urgent need to plan the consumption of the resources in sustainable manner in order to conserve natural resources for future generation.

Sustainable development is becoming popular in the world for saving the earth. Utilizing resources in judicially can save the earth's precious resources. Measurement of environmental components is the most effective step to conserve and protect natural resources.

Environmental auditing had begun in the early 1970s with provision of civil lawsuits for non-compliance with environmental regulations. Environment auditing involves on site visit, collection of samples, performing analyses, and report results to competent authorities.

Industry, the corporate world is initiating auditing for saving natural resources. Academic institutions also can contribute to the preservation and conservation of resources within their premises.

In this "Environment Audit" report would help everyone to think about preserving resources, show willingness to learn their importance, adopt steps to minimize resource use and set an example for others to follow the path of eco-friendly practices to achieve the goal of sustainable development. Effective implementation of environmental auditing helps in minimization of environmental risks at low cost.

OVERVIEW OF THE COLLEGE

Catalyst College is a Constituent unit of Patliputra University, Patna. It was established in the year 2001 to foster the cause of education for women in the state of Bihar. The college possesses a campus of 1.07 acres with a student strength of 159 and 39 strong core faculty members along with visiting/ guest faculties.

As an institution of learning it has a commanding presence both in the University as well as in the capital of the state college while maintaining its exemplary record in University examinations.

MISSION

Our mission is to adapt to the evolving needs of society by focusing on the following key aims:

1. Skill Development: We are committed to enhancing the skills of unskilled and semi-skilled individuals, school and college dropouts, and underprivileged members of society. Through industrial training and a robust curriculum, we aim to enable them to achieve high performance.
2. Empowerment of Underprivileged Communities: Our focus is on providing affordable vocational education to weaker sections of society, particularly in the backward regions of eastern India. By implementing sound business and management practices, we aim to help individuals earn a sustainable livelihood, contributing to poverty alleviation.
3. Optimization of Human Potential: We strive to unlock the potential of people in eastern India, particularly in rural and semi-rural areas. By offering superior training solutions, we enhance their engagement in various vocations, fostering happiness and prosperity.
4. Compassionate Vocational Training: We actively serve the community by providing high-quality, compassionate livelihood training. Our goal is to make human resources more productive and proactive, empowering individuals to contribute meaningfully to society.
5. Youth Empowerment: We focus on preparing youth to become productive adults through entrepreneurship development, technology innovation, and skill education. By equipping them with essential knowledge and skills, we aim to improve their quality of life and that of their families and communities.

VISION

Our vision is to maintain an unwavering commitment to the highest quality standards in education, continuously illuminating society with knowledge and innovation. In pursuit of this vision, we are dedicated to:

1. Value-Based Education: We strive to develop and promote a professional educational system grounded in strong values, fostering innovation at every level.
2. Knowledge Advancement: We are committed to keeping pace with the ever-expanding frontiers of knowledge, making significant contributions to the growth of an intellectually vibrant society through pioneering educational initiatives
3. Inspirational Leadership: As a value-based organization, we aim to inspire leadership and satisfy intellectual curiosity. We embrace a progressive ethos rooted in humanistic traditions, community involvement, accountability, integrity, and respect for all.

By embodying these principles, we stand on the threshold of substantial growth, driven by our continuous commitment to excellence and our proven ability to deliver the best in education. Through this vision, we aspire to empower individuals and communities, shaping a brighter future for all.

AUDIT PARTICIPANTS

On behalf of college

Name	Designation
Mr. Neeraj Agrawal	*Principal*
Mr. Amit Shukla	*IQAC Coordinator*
Dr. Pawan Kumar Jha	*Member*
Dr. Neeraj Poddar	*Member*
Dr. Reena Prasad	*Member*
Mr. Ravi Kumar Soni	*Member*
Mr. Nitish Rohitgi	*Member*

On behalf of GREEN INDIA MISSION

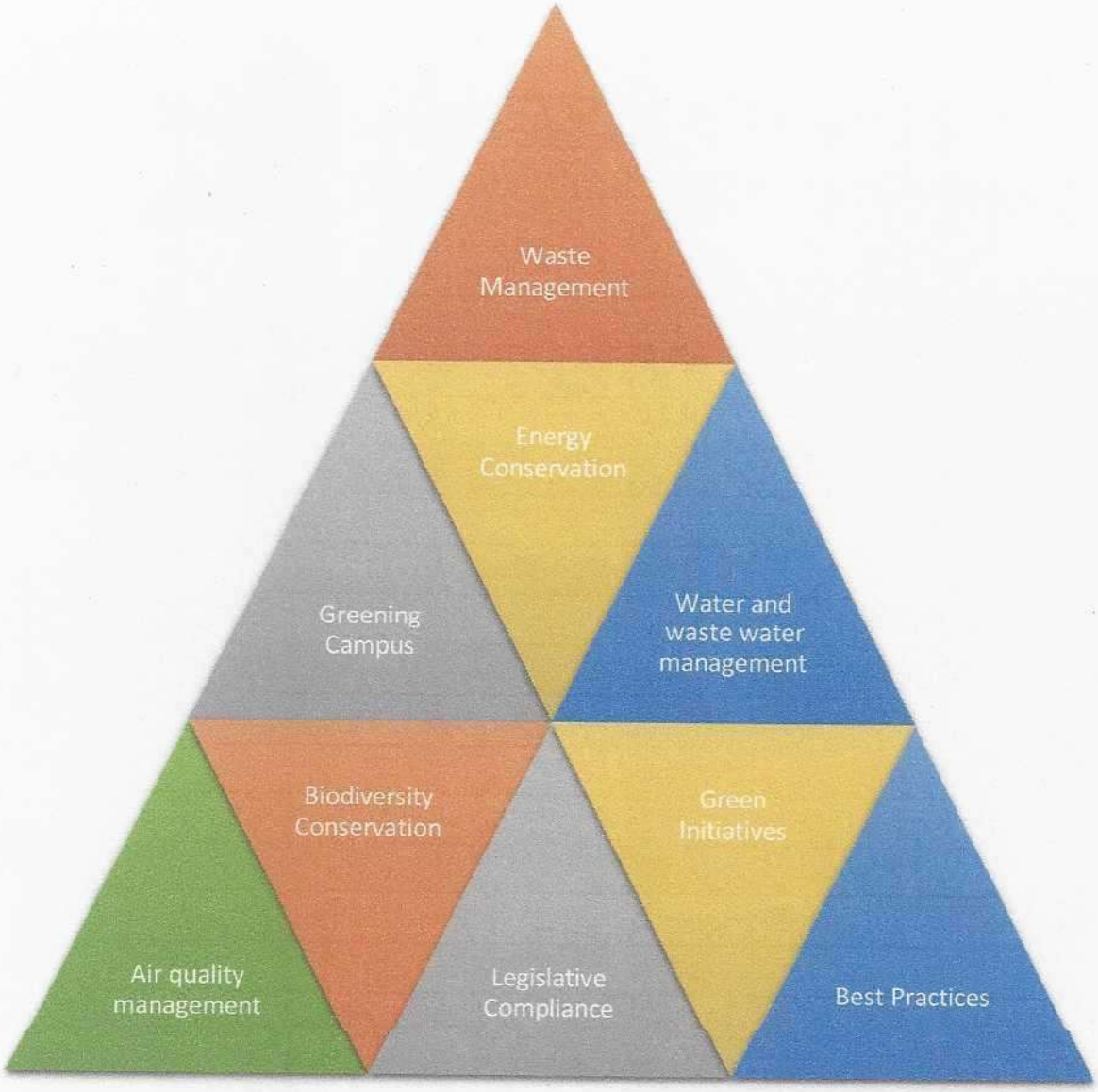
Name	Position	Qualifications
Dr. Arvind Kumar Singh	**BEE & BIS Certified Auditor**	*Ph.D., MSc. (Environment & Management)*
Dr. Mirza H. Abbas	**Co-Auditor**	M.Sc(Physics), Field Expert

EXECUTIVE SUMMARY

The environment assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes out-dated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. Our approach to promote a Green Campus to inculcate the sustainable value systems among the students, so that they carry the learning and practices them in their future endeavors. This will ensure that Sustainability and Environmental practices get embedded in all the institutions and organizations in the country.

A Green Campus is a place where environmentally friendly practices and education combine to promote sustainability in the campus which ultimately offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social and economic needs of the mankind.

This is very second environment audit of College for doing their bit towards environmental protection and environmental awareness at local and global front. Audit criterion is environmental cognizance, waste minimization and management, biodiversity conservation, water conservation, energy conservation and environmental legislative compliance by the campus. A questionnaire is used during audit. This audit report contains observations and recommendations for improvement of environmental consciousness.



WASTE MANAGEMENT

TYPES OF WASTE ON COLLEGE CAMPUS

To create effective waste management plans, College first need to know the types of waste they produce. Below, we have compiled a list of various kinds of waste commonly generated on institutional campus:

1. **Food Waste** - College campus generates food waste. The average mess and canteen generates approximately 5 kg of food waste a day. The reasons for food waste on an educational campus may be over purchasing food to ensure a sufficient supply and then throwing it away, especially in canteen/cafeteria where plentiful stores are essential. And in the cafeteria, students may pile food on to their ample trays, find it unappealing once they sit down and dutifully scrape it into the garbage. Immediate attention is given to the food waste minimization techniques.
2. **Recyclable Paper, Cardboard, Plastic, Glass and Cans** -Campus tends to produce vast quantities of these recyclables. Even in the digital age, many students, professors and staff members still prefer handwritten notes and end up with piles of unwanted paper once their courses and projects are complete. The snacks so essential for socializing tend to come in recyclable plastic, glass or aluminum containers. And shipments of necessary items throughout the year are likely to arrive in recyclable plastic and cardboard packaging. The same is sold/auctioned to the scrap vendors time to time.

3. **Student Clothes and House wares-** As we have mentioned above, many students find it more convenient to throw away their clothes and dorm furnishings at the end of the year than donate or recycle them.

4. **E–Waste-Student and facility electronics often form a large portion of a campus's waste** — As campus continually upgrade their computing facilities and office computer stoke pup with the latest technology, the old computers have to go somewhere. Same is the case with old printers, phones, copy machines and other electronics that receive upgrades over the years. Discarded student electronics often become part of a College's waste stream as well. Students may throw away old phones, TVs, tablets, laptops and printers, along with cords and other accessories. Recycling is a much more eco-friendly option — the metals in old electronics often have a high reuse value. College has tie-up with external authorized agency details mentioned in legislation compliances.

5. **Maintenance Waste-** In the maintenance department, spent paints, solvents, adhesives and lubricants all form potentially hazardous waste. Because they are difficult to recycle, spent incandescent light bulbs usually become landfill waste. Spent fluorescent light bulbs, which contain small amounts of mercury, typically require special handling because of the environmental and health risks they pose.

6. **Furniture** - Furniture waste on a college campus has a couple different sources. The campus itself may also get rid of old furniture as it modernizes its classrooms, cafeterias, computer labs and study spaces. Annually sold to junk dealer.

7. **Books/Magazines/Newspapers** - Books accounted for solid waste generation and College often generate tons of textbook waste. As courses upgrade to new editions, they may end up throwing their newly obsolete textbooks into the garbage if donation programs cannot use them. Students of Catalyst College for Teacher Education donates their text books and notes to junior students, or else are auctioned to reseller.

8. **C & D Waste** - Expansion of college campus building and renovation works result significant amount of construction and demolition waste that should be either used for back filling or disposed off through authorized dumping site by CPCB/SPCB.

9. **Solid Waste** - The College is managing solid waste by providing it to the Municipal Corporation.

ENERGY CONSERVATION

1. **List ten ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.**

   - *Using Energy efficient appliances*
   - *Switching off the electrical equipment when not in use*
   - *Use of Air conditioners at optimum temperatures as per the utilization schedule*
   - *LED lights installed*

2. **Are there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some**

   Yes, CATALYST COLLEGE has adopted energy saving techniques
   - *LEDs installed*
   - *Use of Air conditioners at optimum temperatures*
   - *Solar panels installed*

3. **How many CFL/LED bulbs has your institute installed?**

   CATALYST COLLEGE has replaced almost 99% of the conventional bulbs and tube lights with LED Lights.

4. **Do you run "switch off" drills at institute?**

Yes

5. **Are your computers and other equipment's put on power-saving mode?**

Yes, CATALYST COLLEGE *put the equipment on power saving mode*

WATER AND WASTE-WATER MANAGEMENT

1.List uses of water in your institute

Basic use of water in campus:

Drinking– 17.43KL/month

Gardening–4Kl/month

Kitchen and Toilets –22.44KL/month

Others – 40.02KL/month

Total = 83.89KL/Month

Note: Water calculations are carried out on basis of National Building Code2016

2 How does your institute store water? Are there any water saving techniques followed in your institute?

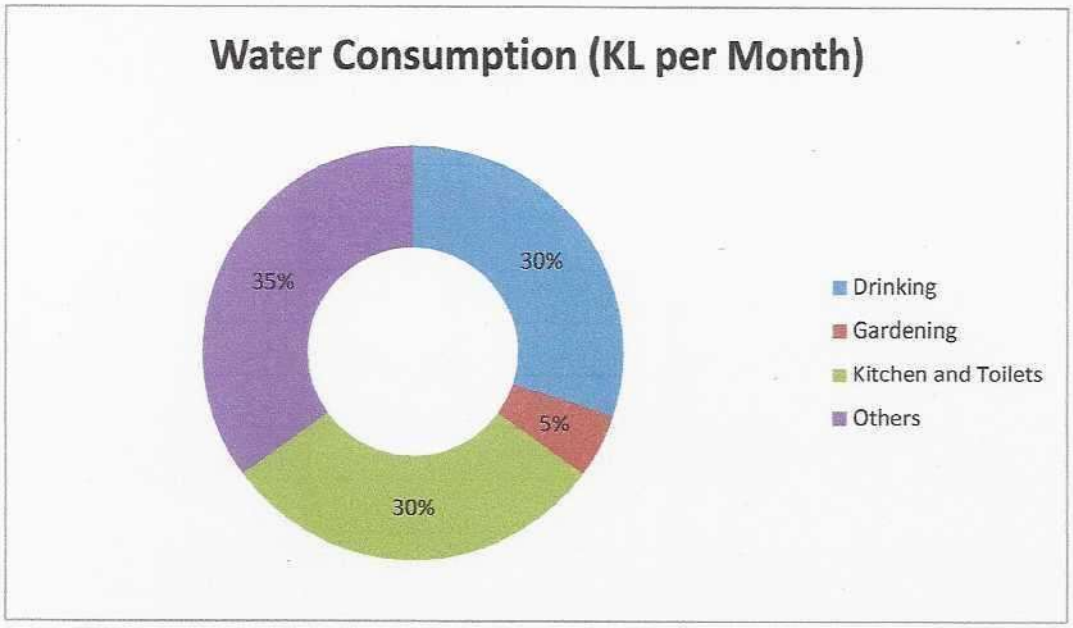
College stores water in terrace tanks.

Saving Techniques
Avoid overflow of water-controlled valves are provided in water supply system.
Close supervision for water supply system.
Rain water harvesting pits are there for ground water recharge.

3. Locate the point of entry of water and point of exit of waste water in your institute. (Entry and Exit)

Entry- Water comes from Municipal Corporation, Borewell and Rain water Harvesting.

Exit- From Canteen, Toilets and bathrooms through covered drainage which is connected to sewage line and Soakpit.



4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Water Conservation awareness for new students*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*
- *Reuse RO waste water in washrooms*

5. Does your institute harvest rainwater?

Yes ,there are rainwater harvesting pit for better ground water recharge

6. Is there any water recycling System?

YES

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AIR QUALITY MANAGEMENT

1. Are the Rooms in Campus Well Ventilated?

Yes, as per National Building Code, guidelines

2. Window Floor ratio of the Rooms?

Very Good, ample daylight utilization because of big windows.

3. What is the ownership of the vehicles used by your campus?

CATALYST COLLEGE *have no own Vehicles.*

4. Provide details of college-owned vehicles?

Details of college-owned vehicles	*Buses*	*Cars*	*Vans*	*Other*	*Total*
No. of vehicles	*0*	*0*	*0*	*0*	*0*

5. PUC done?

NA

6. Specify the type of fuel used by your campus's vehicles

NA

8.Air Quality Monitoring Program (If,Any)

No monitoring is being done

ENVIRONMENT LEGISLATIVE COMPLIANCE

1. Are you aware of any environmental Laws Pertaining to different aspects of environmental management?

Yes

2. Does your institute have any rules to protect the environment? List possible Rules you could include.

Yes, the eco harmony club of CATALYST COLLEGE *is conscious of the environmental protection and takes proper measures in terms of awareness campaigns, activities, etc.*

3. Does Environmental Ambient Air Quality Monitoring conducted by the Institute?

No

4. Does Environmental Water and Waste water Quality monitoring conducted by the Institute?

No

5. Does stack monitoring of DG sets conducted by the Institute?

No

6. Is any warning notice, letter issued by state government bodies?

No

7. Does any Hazardous waste generate by the Institute?

Yes, computer scrap is generated by the Institute

GENERAL INFORMATION

1. Does your institute have any rules to protect the environment? List possible rules you could include.

Yes, CATALYST COLLEGE *eco club carries out various programs for environment protection periodically on the campus.*

2. Are students and faculties aware of environmental cleanliness ways? If Yes Explain

Yes, college organizes various activities for environment cleanliness

- *Reduce carbon footprints by opting energy saving methods and using public commutes.*
- *Recycling of waste products*
- *Avoid single use plastic*
- *Less use of paper*

3. Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?

Yes, World Environment Day, Ozone Day, Earth Day, and more are celebrated by campus. Furthermore, CATALYST COLLEGE *organizes different activities like Donation drive, cleanliness drive, awareness on Namami Gange project, plantation drive and many more.*

4. Does Institute participate in National and Local Environmental Protection Movement?

No

5. Does Institute have any Recognition or certification for environment friendliness?

Yes

6. Does Institution conduct a green or environmental audit of its campus?

Yes,this is not first time environmental audit carried out by the College.

BEST PRACTICES

- There is ban on single use plastic and plastic crockery in the campus.
- College has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- College has two types of containers for disposing the waste material – (i) Green Color for Wet organic waste material, (ii) Blue Color for dry waste material.
- Solar panels (05kWp) have been installed in the campus.
- Installation of rain water harvesting systems in campus buildings.
- Students are involved in 'Best out of waste projects' such as paper-bag making, cardboard dustbin making etc. for recycling of waste materials. Old newspapers, magazines, answer books etc. are periodically sold to recycling agents.
- Vermi-compost pits present in the Herbal Garden that effectively uses organic plant waste to produce manure that is then used in the college gardens.
- The college is actively engaged in coordinating cleanliness activities within and beyond the campus, aligning with the vision of the Swachh Bharat Abhiyan. This includes raising awareness about cleanliness and hygiene through regular drives, rallies, and the active participation of students and staff in cleanliness efforts.

Initiatives by college's Eco Club

- Cleaning of Marine drive area of Patna Punit Sagar Abhiyan OnSep22,2022
- College participated in Namami Gange project's district conference on 18th Dec 2022
- On the occasion of National youth week (12th Jan 2023), awareness campaign was carried out in nearby slum area (Digha Ashiyana area) for children along with donation drive
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The audit has identified some observations for making the campus premise more environmental friendly. The recommendations are also mentioned with observations for the college campus team to initiate actions. The audit team opines that the overall site is well maintained from an environmental perspective.

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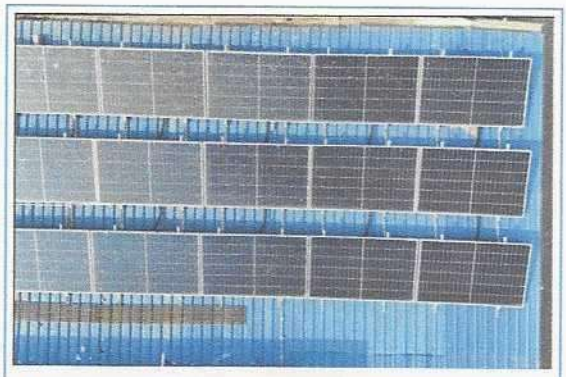

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GREEN INDIA MISSION ESTD 2017 PATNA (BIHAR)

Senior Auditor
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President
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Patna (Bihar)

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Patna (Bihar)

CATALYST COLLEGE

ENVIRONMENT AUDIT REPORT

2022-23

PREPARED BY
GREEN INDIA MISSION
IN ASSOCIATION WITH AYAN ENTERPRISES

Table of content

ACKNOWLEDGEMENT

GREEN INDIA MISSION would like to thank the management of Catalyst College, Patna for assigning this important work of Environment Audit. We appreciate the co-operation to the teams for completion of assessment.

First of all, we would like to thank *Neeraj Agrawal-Principal* for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank *Amit Shukla - Audit Coordinator*, for his/her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

1. *Dr.Neeraj Poddar*
2. *Mr. Nitish Rohitgi*
3. *Dr.Pawan Kumar Jha*
4. *Dr.Reena Prasad*
5. *Mr. Ravi Kumar Soni*

14/09/2023

General Secretary
Green India Mission
Patna (Bihar)

GREEN INDIA MISSION
ESTD 2017
PATNA (BIHAR)

DISCLAIMER

GREEN INDIA MISSION Audit Team has prepared this report for Catalyst College based on data submitted by the representatives of College complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made available and no responsibility and liability is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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GREEN INDIA MISSION, its staff and agents shall keep confidential all the information relating to your organisation and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies.

GREEN INDIA MISSION staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a need to know basis.

Dr. Arvind Kumar Singh
BEE & BIS Certified Auditor
ID No.EM-7059/2017 SIM-14595

GREEN INDIA MISSION EST. 2017 PATNA (BIHAR)

General Secretary
Green India Mission
Patna (Bihar)
General Secretary
Green India Mission, Patna

CONCEPT AND CONTEXT

Environment Protection Act, 1986 by the Ministry of Environment of forests on 13th march, 1992. As per this act, every person owning an industry or performing an operation or process needs a legal consent and must submit an environmental report or statement.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the sustainable environment.

In view of the NAAC circular regarding environment auditing, the College management decided to conduct an external environment assessment study by a competent external professional auditor.

The term 'Environmental audit' means differently to different people. Terms like 'assessment', 'survey' and 'review' are also used to describe similar activities. Furthermore, some organizations believe that an 'environmental audit' addresses only environmental matters, whereas others use the term to mean an audit of health, safety and environment-related matters. Although there is no universal definition of Environment Audit, many leading companies/institutions follow the basic philosophy and approach summarized by the broad definition adopted by the International Chambers of Commerce (ICC) in its publication of Environmental Auditing (1989).

The ICC defines Environmental Auditing as:

"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects."

This audit focuses on the environment legal compliances and implementation of rules defined by MOEFCC or state pollution control board. The concepts, structure, objectives, methodology, tools of analysis, and objectives of the audit are discussed below.

INTRODUCTION

Nature is God gifted precious gift for all of us. Disturbance in the nature causes environmental Problems. These are increasing day by day as a result of development of urbanization and industrialization on earth. Because of unplanned utilization of resources, our planet is facing tremendous pressure results a sharp rise in temperature. Therefore, there is an urgent need to plan the consumption of the resources in sustainable manner in order to conserve natural resources for future generation.

Sustainable development is becoming popular in the world for saving the earth. Utilizing resources in judicially can save the earth's precious resources. Measurement of environmental components is the most effective step to conserve and protect natural resources.

Environmental auditing had begun in the early 1970s with provision of civil lawsuits for non-compliance with environmental regulations. Environment auditing involves on site visit, collection of samples, performing analyses, and report results to competent authorities.

Industry, the corporate world is initiating auditing for saving natural resources. Academic institutions also can contribute to the preservation and conservation of resources within their premises.

In this "Environment Audit" report would help everyone to think about preserving resources, show willingness to learn their importance, adopt steps to minimize resource use and set an example for others to follow the path of eco-friendly practices to achieve the goal of sustainable development. Effective implementation of environmental auditing helps in minimization of environmental risks at low cost.

GREEN INDIA MISSION ESTD 2017 PATNA (BIHAR)

OVERVIEW OF THE COLLEGE

Catalyst College is a Constituent unit of Patliputra University, Patna. It was established in the year 2001 to foster the cause of education for women in the state of Bihar. The college possesses a campus of 1.07 acres with a student strength of 328 and 48 strong core faculty members along with visiting/ guest faculties.

As an institution of learning it has a commanding presence both in the University as well as in the capital of the state while maintaining its exemplary record in University examinations.

MISSION

Our mission is to adapt to the evolving needs of society by focusing on the following key aims:

1. Skill Development: We are committed to enhancing the skills of unskilled and semi-skilled individuals, school and college dropouts, and underprivileged members of society. Through industrial training and a robust curriculum, we aim to enable them to achieve high performance.
2. Empowerment of Underprivileged Communities: Our focus is on providing affordable vocational education to weaker sections of society, particularly in the backward regions of eastern India. By implementing sound business and management practices, we aim to help individuals earn a sustainable livelihood, contributing to poverty alleviation.
3. Optimization of Human Potential: We strive to unlock the potential of people in eastern India, particularly in rural and semi-rural areas. By offering superior training solutions, we enhance their engagement in various vocations, fostering happiness and prosperity.
4. Compassionate Vocational Training: We actively serve the community by providing high-quality, compassionate livelihood training. Our goal is to make human resources more productive and proactive, empowering individuals to contribute meaningfully to society.
5. Youth Empowerment: We focus on preparing youth to become productive adults through entrepreneurship development, technology innovation, and skill education. By equipping them with essential knowledge and skills, we aim to improve their quality of life and that of their families and communities.

VISION

Our vision is to maintain an unwavering commitment to the highest quality standards in education, continuously illuminating society with knowledge and innovation. In pursuit of this vision, we are dedicated to:

1. Value-Based Education: We strive to develop and promote a professional educational system grounded in strong values, fostering innovation at every level.
2. Knowledge Advancement: We are committed to keeping pace with the ever-expanding frontiers of knowledge, making significant contributions to the growth of an intellectually vibrant society through pioneering educational initiatives
3. Inspirational Leadership: As a value-based organization, we aim to inspire leadership and satisfy intellectual curiosity. We embrace a progressive ethos rooted in humanistic traditions, community involvement, accountability, integrity, and respect for all.

By embodying these principles, we stand on the threshold of substantial growth, driven by our continuous commitment to excellence and our proven ability to deliver the best in education. Through this vision, we aspire to empower individuals and communities, shaping a brighter future for all..

GREEN INDIA MISSION ESTD. 2017 PATNA (BIHAR)

AUDIT PARTICIPANTS

On behalf of college

Name	Designation
Mr. Neeraj Agrawal	*Principal*
Mr. Amit Shukla	*IQAC Coordinator*
Dr.Pawan Kumar Jha	*Member*
Dr.Neeraj Poddar	*Member*
Dr.Reena Prasad	*Member*
Mr. Ravi Kumar Soni	*Member*
Mr. Nitish Rohitgi	*Member*

On behalf of GREEN INDIA MISSION

Name	Position	Qualifications
Dr.Arvind Kumar Singh	**BEE & BIS Certified Auditor**	*Ph.D., MSc.(Environment & Management)*
Dr. Mirza H. Abbas	**Co-Auditor**	M.Sc(Physics), Field Expert

EXECUTIVE SUMMARY

The environment assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes out-dated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. Our approach to promote a Green Campus to inculcate the sustainable value systems among the students, so that they carry the learning and practices them in their future endeavours. This will ensure that Sustainability and Environmental practices get embedded in all the institutions and organizations in the country.

A Green Campus is a place where environmentally friendly practices and education combine to promote sustainability in the campus which ultimately offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social and economic needs of the mankind.

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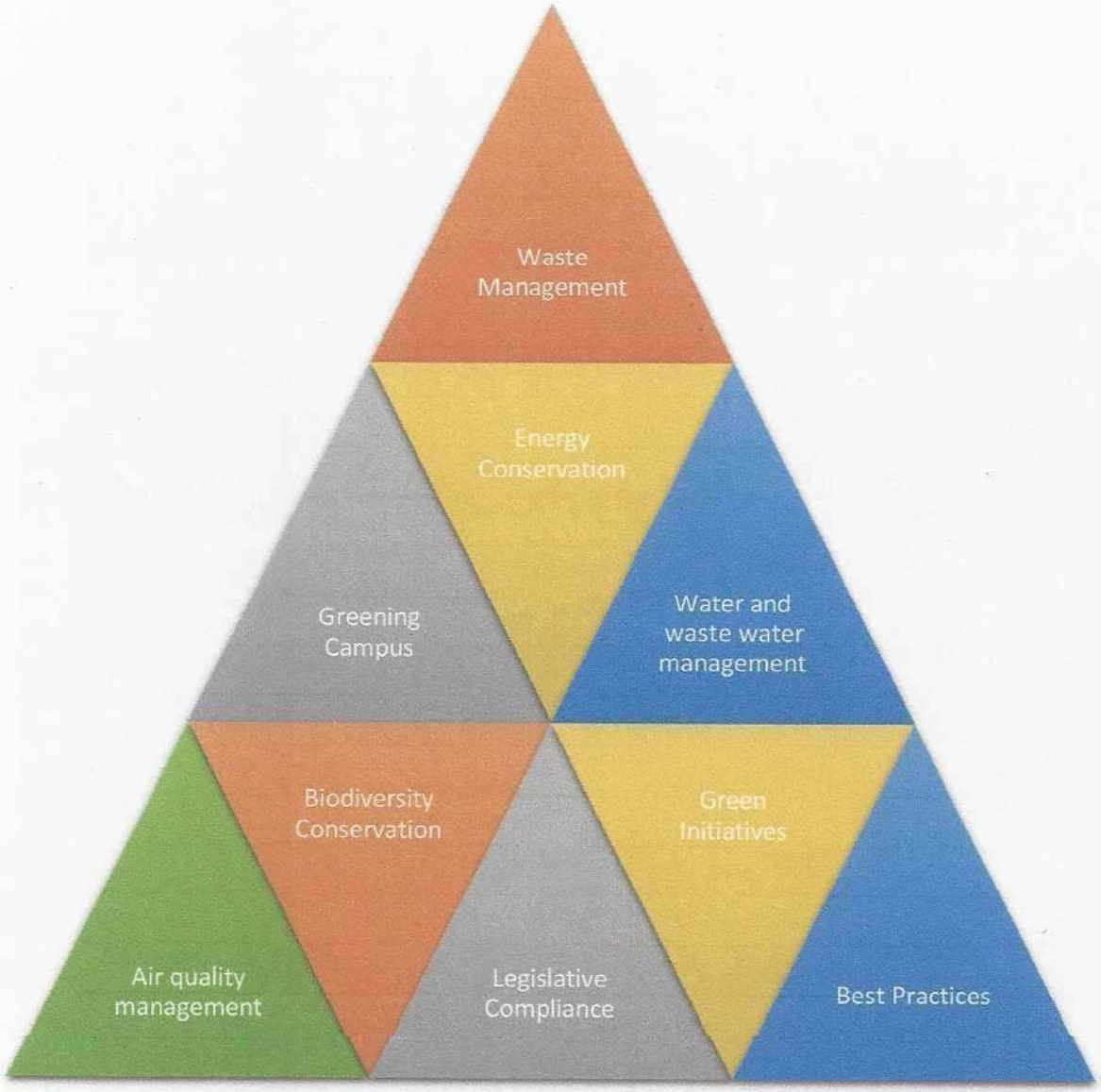
This is very second environment audit of College for doing their bit towards environmental protection and environmental awareness at local and global front. Audit criterion is environmental cognizance, waste minimization and management, biodiversity conservation, water conservation, energy conservation and environmental legislative compliance by the campus. A questionnaire is used during audit. This audit report contains observations and recommendations for improvement of environmental consciousness.



WASTE MANAGEMENT

TYPES OF WASTE ON COLLEGE CAMPUS

To create effective waste management plans, College first need to know the types of waste they produce. Below, we have compiled a list of various kinds of waste commonly generated on institutional campus:

1. **Food Waste** - College campus generates food waste. The average mess and canteen generates approximately 5 kg of food waste a day. The reasons for food waste on an educational campus may be over purchasing food to ensure a sufficient supply and then throwing it away, especially in canteen/cafeteria where plentiful stores are essential. And in the cafeteria, students may pile food on to their ample trays, find it unappealing once they sit down and dutifully scrape it into the garbage. Immediate attention is given to the food waste minimization techniques.
2. **Recyclable Paper, Cardboard, Plastic, Glass and Cans** -Campus tends to produce vast quantities of these recyclables. Even in the digital age, many students, professors and staff members still prefer handwritten notes and end up with piles of unwanted paper once their courses and projects are complete. The snacks so essential for socializing tend to come in recyclable plastic, glass or aluminum containers. And shipments of necessary items throughout the year are likely to arrive in recyclable plastic and cardboard packaging. The same is sold/auctioned to the scrap vendors time to time.

3. **Student Clothes and House wares**- As we have mentioned above, many students find it more convenient to throw away their clothes and dorm furnishings at the end of the year than donate or recycle them.

4. **E–Waste-Student and facility electronics often form a large portion of a campus's waste** — As campus continually upgrade their computing facilities and office computer stoke pup with the latest technology, the old computers have to go somewhere. Same is the case with old printers, phones, copy machines and other electronics that receive upgrades over the years. Discarded student electronics often become part of a College's waste stream as well. Students may throw away old phones, TVs, tablets, laptops and printers, along with cords and other accessories. Recycling is a much more eco-friendly option — the metals in old electronics often have a high reuse value. College has tie-up with external authorized agency details mentioned in legislation compliances.

5. **Maintenance Waste-** In the maintenance department, spent paints, solvents, adhesives and lubricants all form potentially hazardous waste. Because they are difficult to recycle, spent incandescent light bulbs usually become landfill waste. Spent fluorescent light bulbs, which contain small amounts of mercury, typically require special handling because of the environmental and health risks they pose.

6. **Furniture** - Furniture waste on a college campus has a couple different sources. The campus itself may also get rid of old furniture as it modernizes its classrooms, cafeterias, computer labs and study spaces. Annually sold to junk dealer.

7. **Books/Magazines/Newspapers** - Books accounted for solid waste generation and College often generate tons of textbook waste. As courses upgrade to new editions, they may end up throwing their newly obsolete textbooks into the garbage if donation programs cannot use them. Students of Catalyst College for Teacher Education donates their text books and notes to junior students, or else are auctioned to reseller.

8. **C & D Waste** - Expansion of college campus building and renovation works result significant amount of construction and demolition waste that should be either used for back filling or disposed off through authorized dumping site by CPCB/SPCB.

9. **Solid Waste** - The College is managing solid waste by providing it to the Municipal Corporation.

ENERGY CONSERVATION

1. **List ten ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.**

   - *Using Energy efficient appliances*
   - *Switching off the electrical equipment when not in use*
   - *Use of Air conditioners at optimum temperatures as per the utilization schedule*
   - *LED lights installed*

2. **Are there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some**

   Yes, CATALYST COLLEGE has adopted energy saving techniques
   - *LEDs installed*
   - *Use of Air conditioners at optimum temperatures*
   - *Solar panels installed*

3. **How many CFL/LED bulbs has your institute installed?**

   CATALYST COLLEGE has replaced almost 99% of the conventional bulbs and tube lights with LED Lights.

4. **Do you run "switch off" drills at institute?**

Yes

5. **Are your computers and other equipment's put on power-saving mode?**

Yes, CATALYST COLLEGE *put the equipment on power saving mode*

WATER AND WASTE-WATER MANAGEMENT

1.List uses of water in your institute

Basic use of water in campus:

Drinking– 22.43KL/month

Gardening–5Kl/month

Kitchen and Toilets –29.44KL/month

Others – 40.02KL/month

Total = 96.89KL/Month

Note: Water calculations are carried out on basis of National Building Code2016

2 How does your institute store water? Are there any water saving techniques followed in your institute?

College stores water in terrace tanks.

Saving Techniques
Avoid overflow of water-controlled valves are provided in water supply system.
Close supervision for water supply system.
Rain water harvesting pits are there for ground water recharge.

3. Locate the point of entry of water and point of exit of waste water in your institute. (Entry and Exit)

Entry- Water comes from Municipal Corporation, Borewell and Rain water Harvesting.

Exit- From Canteen, Toilets, and bathrooms through covered drainage which is connected to sewage line and Soakpit.

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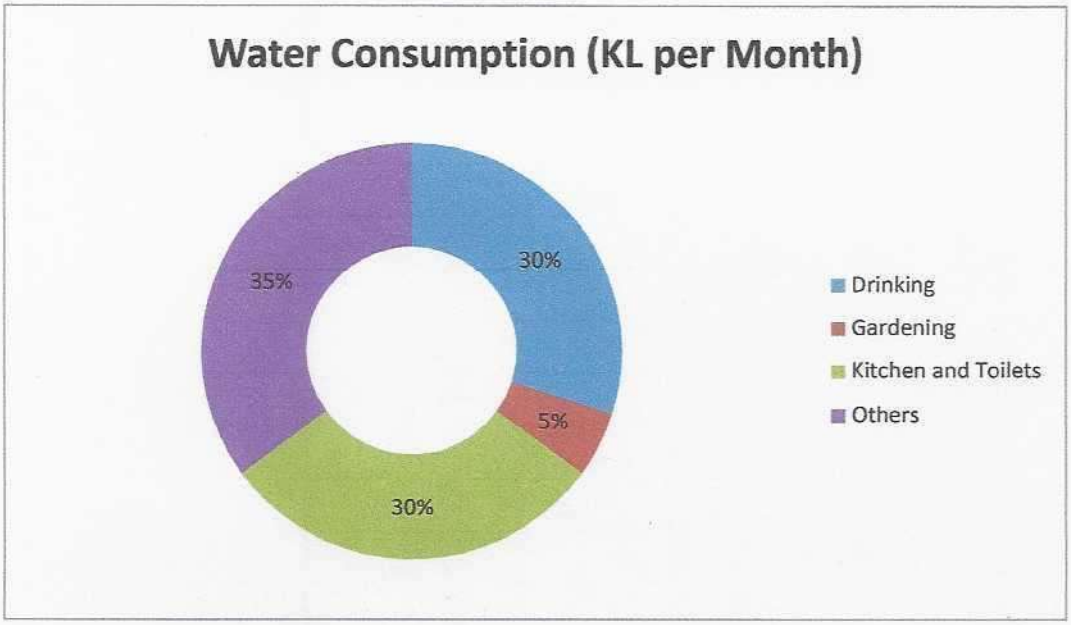

4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Water Conservation awareness for new students*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*
- *Reuse RO waste water in washrooms*

5. Does your institute harvest rainwater?

Yes ,there are rainwater harvesting pit for better ground water recharge

6. Is there any water recycling System?

YES

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AIR QUALITY MANAGEMENT

1. Are the Rooms in Campus Well Ventilated?

Yes, as per National Building Code, guidelines

2. Window Floor ratio of the Rooms?

Very Good, ample daylight utilization because of big windows.

3. What is the ownership of the vehicles used by your campus?

CATALYST COLLEGE *have no own Vehicles.*

4. Provide details of college-owned vehicles?

Details of college-owned vehicles	*Buses*	*Cars*	*Vans*	*Other*	*Total*
No. of vehicles	*0*	*0*	*0*	*0*	*0*

5. PUC done?

NA

6. Specify the type of fuel used by your campus's vehicles

NA

8.Air Quality Monitoring Program (If,Any)

No monitoring is being done

ENVIRONMENT LEGISLATIVE COMPLIANCE

1. Are you aware of any environmental Laws Pertaining to different aspects of environmental management?

Yes

2. Does your institute have any rules to protect the environment? List possible Rules you could include.

Yes, the eco harmony club of CATALYST COLLEGE *is conscious of the environmental protection and takes proper measures in terms of awareness campaigns, activities, etc.*

3. Does Environmental Ambient Air Quality Monitoring conducted by the Institute?

No

4. Does Environmental Water and Waste water Quality monitoring conducted by the Institute?

No

5. Does stack monitoring of DG sets conducted by the Institute?

No

6. Is any warning notice, letter issued by state government bodies?

No

7. Does any Hazardous waste generate by the Institute?

Yes, computer scrap is generated by the Institute

GREEN INDIA MISSION * ESTD-2017 * PATNA (BIHAR)

GENERAL INFORMATION

1. Does your institute have any rules to protect the environment? List possible rules you could include.

Yes, CATALYST COLLEGE *eco club carries out various programs for environment protection periodically on the campus.*

2. Are students and faculties aware of environmental cleanliness ways? If Yes Explain

Yes, college organizes various activities for environment cleanliness

- *Reduce carbon footprints by opting energy saving methods and using public commutes.*
- *Recycling of waste products*
- *Avoid single use plastic*
- *Less use of paper*

3. Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?

Yes, World Environment Day, Ozone Day, Earth Day, and more are celebrated by campus. Furthermore, CATALYST COLLEGE *organizes different activities like Donation drive, cleanliness drive, awareness on Namami Gange project, plantation drive and many more.*

4. Does Institute participate in National and Local Environmental Protection Movement?

No

5. Does Institute have any Recognition or certification for environment friendliness?

Yes

6. Does Institution conduct a green or environmental audit of its campus?

Yes,this is not first time environmental audit carried out by the College.

GREEN INDIA MISSION ESTD 2017 PATNA (BIHAR)

BEST PRACTICES

- There is ban on single use plastic and plastic crockery in the campus.
- College has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- College has two types of containers for disposing the waste material – (i) Green Color for Wet organic waste material, (ii) Blue Color for dry waste material.
- Solar panels (05kWp) have been installed in the campus.
- Installation of rain water harvesting systems in campus buildings.
- Students are involved in 'Best out of waste projects' such as paper-bag making, cardboard dustbin making etc. for recycling of waste materials. Old newspapers, magazines, answer books etc. are periodically sold to recycling agents.
- Vermi-compost pits present in the Herbal Garden that effectively uses organic plant waste to produce manure that is then used in the college gardens.
- The college is actively engaged in coordinating cleanliness activities within and beyond the campus, aligning with the vision of the Swachh Bharat Abhiyan. This includes raising awareness about cleanliness and hygiene through regular drives, rallies, and the active participation of students and staff in cleanliness efforts.

Initiatives by college's Eco Club

- Cleaning of Marine drive area of Patna Punit Sagar Abhiyan OnSep22,2022
- College participated in Namami Gange project's district conference on 18th Dec 2022
- On the occasion of National youth week (12th Jan 2023), awareness campaign was carried out in nearby slum area (Digha Ashiyana area) for children along with donation drive
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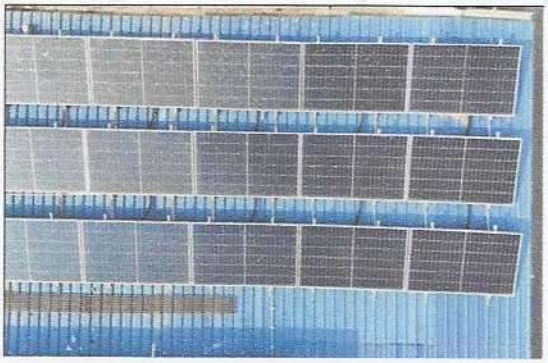

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