

# GREEN AUDIT REPORT



**Charotar University of Science & Technology [CHARUSAT], Changa**

**December 2019**

## EXECUTIVE SUMMARY

The Green Audit of CHARUSAT was conducted to understand the management of various environment components and actions taken thereof.

Following are the important findings of the Green Audit:

Water Management	Necessary steps are taken to reduce the overall water consumption at campus by: <ul style="list-style-type: none"><li>• Optimizing TDS/ RO Reject</li><li>• Implementing Sprinkler Irrigation System</li><li>• 43 % of Total Rain Water (162844.88 m<sup>3</sup> ) harvested on campus</li></ul>
Wastewater Management	Wastewater management is done through: <ul style="list-style-type: none"><li>• Integrated Wetland Technology for Sewage Treatment</li><li>• Soak Pits</li><li>• Future Expansion of STP</li></ul>
Water Bodies	Necessary steps taken for conserving water body: <ul style="list-style-type: none"><li>• Cleaning of water Pond</li><li>• Installation of Aerators for Oxygen replenishment in Pond</li></ul>
Energy Management	Necessary steps taken for energy Management: <ul style="list-style-type: none"><li>• Energy Audit of Campus</li><li>• Replacement of Traditional Lights with LED Lights</li><li>• Installation of Sensor based Lights</li><li>• Solar Power Plant</li></ul>
Built up Environment	Percentage Built up (Land Utilization) Area: 26.52 %
Green Belt	Percentage Area Under Green Cover:70.97 %
Biodiversity	Excellent Biodiversity with Faunal and Floral Heterogeneity
Transportation	Around 50 % manpower travels by Car Pooling
Green Agenda In Syllabus	Variety of Courses for Spreading Environmental Awareness
Green Initiatives	Continued Endeavor for Social and Sustainable development NSS activities for campus and community services
Carbon Accounting	3.25 Tons CO <sub>2</sub> Emission per student per year is much lesser than average Indian and Global CO <sub>2</sub> Emission by University Students
<b>Suggestions:</b>	
<ul style="list-style-type: none"> <li>• To further reduce CO<sub>2</sub> emission by implementing Green Technologies</li> <li>• To minimize the plastic usage in Campus</li> <li>• To consider the possibility of recycling waste paper</li> <li>• To look for the possibility of installing water meters at water supplies</li> <li>• To look for the possibility of recycling RO reject water</li> </ul>	

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## **1. INTRODUCTION**

“Go green before the green goes”. CHARUSAT being one of the most Environmental conscious institutions in Gujarat undertook the project of conducting Green Audit for its Campus. The purpose of organizing Green Audit is to upgrade the environment conditions in and around the campus premises. It is carried out with the aid of performing tasks like waste management, energy saving and similar to turn into a better environmental friendly institute.

In this era of globalization as the money game is gaining momentum but risks to human civilization are also getting deeper because of the inappropriate exploitation of natural and man- made resources. One of the most devastating risks that the business today poses to the world is pollution and we are aware how terrible its effects are on the growth and survival of human civilization. Green audit is a step to safeguard the interest of the Environment and to ensure that organizational activities follow appropriate standards.

The dictionary meaning of Green audit is “Inspection of an organization to assess the total environmental impact of its activities or of a particular product or process.” Green Audit is a systematic process of identification, characterization, documenting and analysis of all environmental components in an establishment. It aims to analyze environmental practices within and outside of organization, which will have an impact on the eco-friendly ambience.

Green audit is a useful tool for a college / universities to determine how and where they are using the natural resources and how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan.

Considering increasing importance of environmental sustainability, and the role of higher educational institutions like CHARUSAT in promoting going Green, this project was carried out to ensure that CHARUSAT contributes towards the environment protection through Carbon Footprint reduction measures. The first Green Audit of CHARUSAT was conducted in year 2016 which was the first of its kind in the state of Gujarat.

## **2. OBJECTIVES OF GREEN AUDIT**

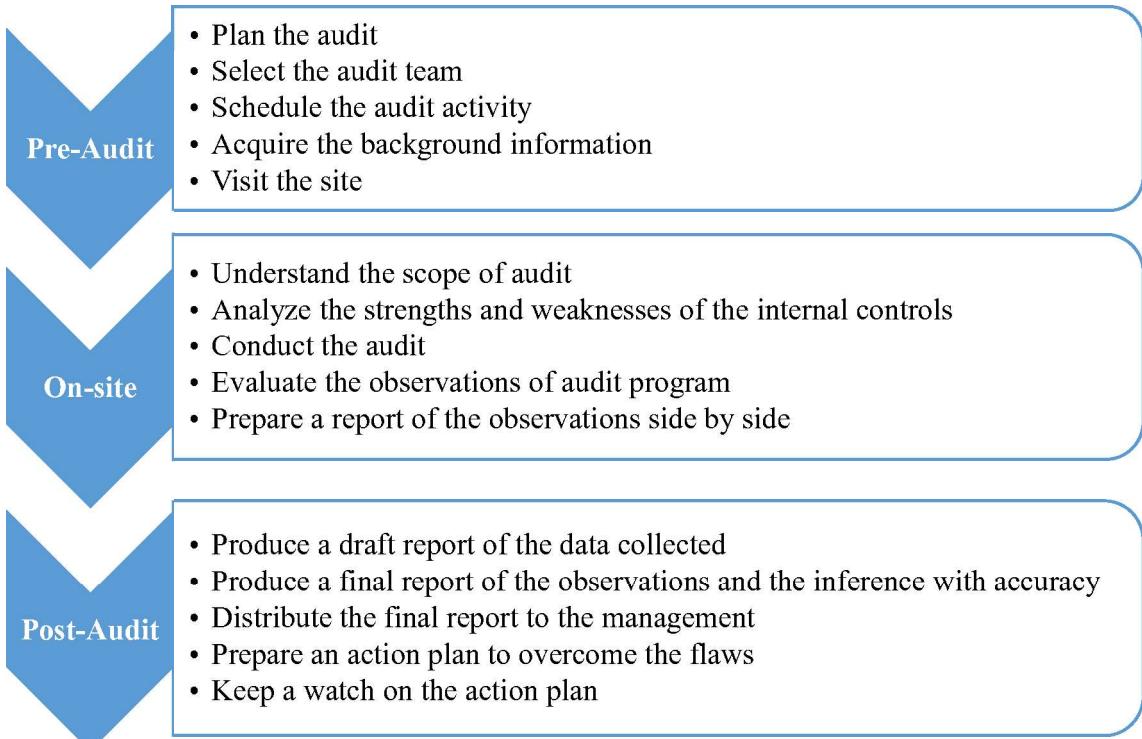
The purpose of the green audit of CHARUSAT is to ensure that the practices followed in the campus are in accordance with the Green Policy adopted.

The objectives are as follows:

1. To secure the healthy working environment for students and staff members
2. To ensure that all environmental rules and regulations are followed
3. To analyze the present situation of Carbon Emission and Footprint
4. To suggest the best protocols for adding to sustainable development

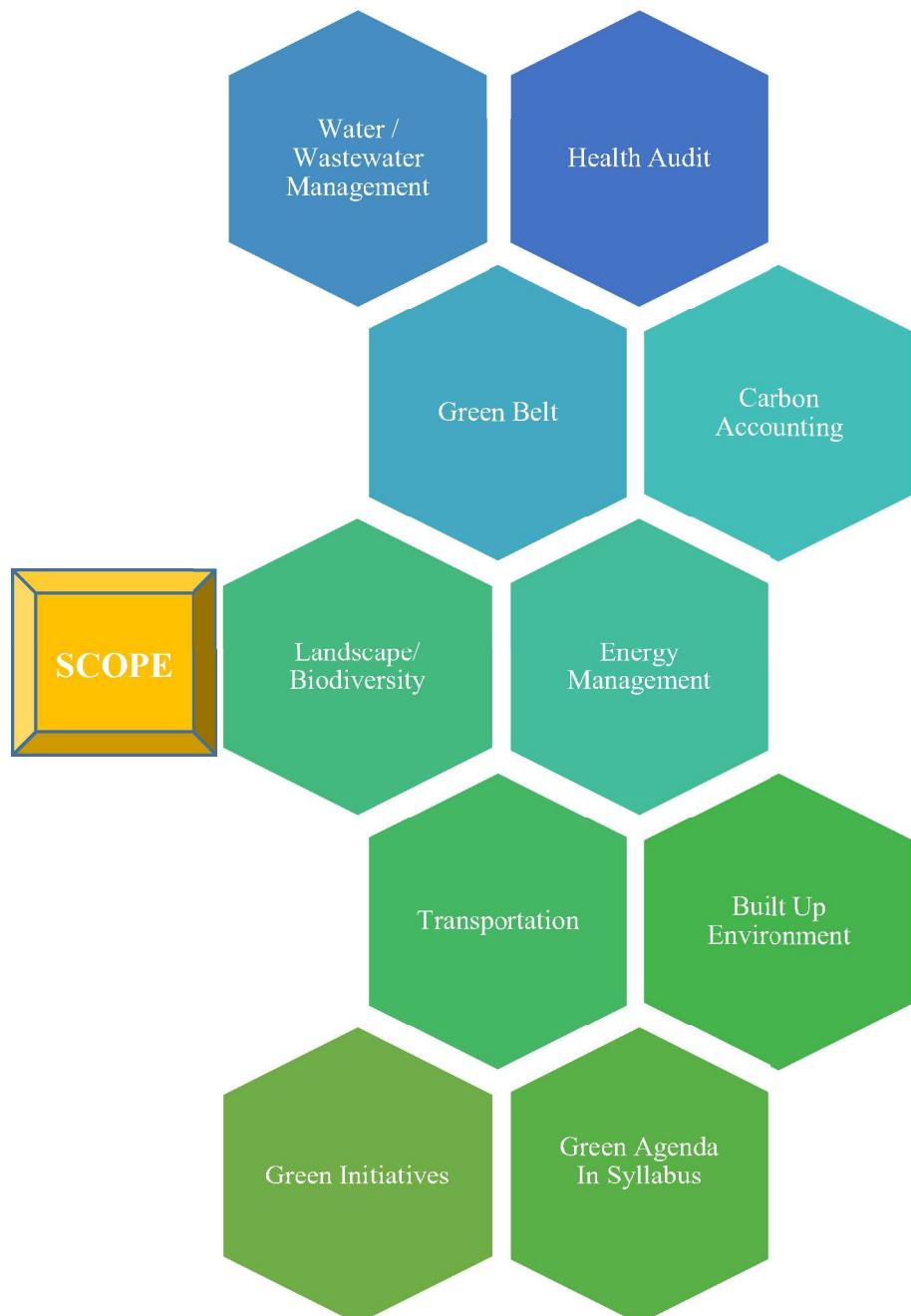
## **3. METHODOLOGY OF GREEN AUDIT**

The methodology includes the background preparations, inspection of the campus, observation and review of the documentation green audit parameters at intervals, interviewing key persons and data analysis and suggestions. Some data have also been taken from the students' project research works carried out by various departments/ institutes.



#### **4. SCOPE OF GREEN AUDIT**

The following environmental components are considered while conducting audit. As the University is also conducting Environment Audit of the campus, scopes are decided based on the objectives of the project and to avoid the overlaps.



## **5. GREEN AUDIT ASSESSMENT TEAM**

<b>Sr. No.</b>	<b>Name</b>	<b>Designation</b>	<b>Affiliation</b>
1	Dr. V. R. Panchal	Professor & Head	M. S. Patel Department of Civil Engineering, CSPIT, CHARUSAT
2	Dr. Dipak Vyas	Ex-Professor & Environment Expert	BVM Engineering College, VV Nagar
3	Mr. Vijay Safaya	Chemical Engineer	M. S. Patel Department of Civil Engineering, CSPIT, CHARUSAT
4	Ms. Mitali Vedanti	Assistant Professor & Environment Expert	M. S. Patel Department of Civil Engineering, CSPIT, CHARUSAT
5	Mr. Gaurav Kapse	Assistant Professor & Environment Expert	M. S. Patel Department of Civil Engineering, CSPIT, CHARUSAT
6	Ms. Hemal Parekh	Assistant Professor & Environment Expert	M. S. Patel Department of Civil Engineering, CSPIT, CHARUSAT

## **6. ABOUT CHARUSAT:**

**Charotar University of Science and Technology (CHARUSAT)** has been conceived by Shri Charotar Moti Sattavis Patidar Kelavani Mandal - a not for profit premier education trust of India having a social lineage of more than 118 years. CHARUSAT has the distinction of being the first private University in the State of Gujarat (India) to be accredited by National Assessment and Accreditation Council (NAAC) with ‘A’ grade in the first cycle. **It is also accredited with ‘A’ Grade by the Knowledge Consortium of Gujarat (KCG), Government of Gujarat.**

CHARUSAT has developed a lush green eco-friendly campus over 120 acres of land. It has under its ambit six faculties, 9 Institutes and 3 Centers (within the constituent institutes), offering more than 70 different UG, PG, and Doctoral Programs. The faculties include Faculty of Technology and Engineering, Faculty of Pharmacy, Faculty of Computer Science & Applications, Faculty of Management Studies, Faculty of Applied Sciences and Faculty of Medical Sciences.

## **7. ENVIRONMENT POLICY:**

CHARUSAT drives the social and sustainable responsibilities in its operations and curriculum by its commitment to preserve the environment. It is committed to Clean & Green Campus.

CHARUSAT will endeavor to exceed the environmental performance improvement and will:

- Support and fully comply with the requirements of statutory bodies
- Follow regulations and codes of practices
- Reduce, Reuse and Recycle the campus waste
- Use energy and water as efficiently as possible
- Apply the principles and knowledge of environmental engineering for welfare of the local community

## Green Audit Report

1	Name of the Organization	Charotar University of Science & Technology (CHARUSAT), Changa
2	<b>Water Management</b>	
2.1	Approximate Water Demand	5,35,005 L/ day
2.2	Water Storage/ Holding Capacity in campus	7,60,522 L
2.3	Number of Water Tanks and Capacity	32 Tanks, Refer Annexure -I
2.4	Number of Water Purifiers Installed	41 Water Purifiers, Refer Annexure -I
2.5	Quality of Drinking Water/ Ground Water	Well within IS 10500:2012 and WHO Standards. For more details on water quality please refer Environment Audit Report.
2.6	Water Conservation Measures	<ul style="list-style-type: none"> <li>1. Display of Save Water Placards, Boards near Water Taps</li> <li>2. Reducing the RO reject by optimizing TDS levels in RO</li> <li>3. Sprinkler Irrigation System for Gardening</li> <li>4. Rain water Harvesting in Campus Premises (Refer Annexure-I for more details)</li> </ul>
3	<b>Wastewater Management</b>	
3.1	Approximate Quantity of Wastewater generated	4,28,004 L/day
3.2	Wastewater Treatment/ disposal measures	<p>100 KLD STP using Integrated Wetland Technology</p> <p>34 Soak Pits / Septic Tanks 1980*6000</p> <p>(Refer Annexure-II for more details)</p>

3.3	Quality of Treated Effluent	Well within standards prescribed by MOEFCC and Environment Protection Rules, 1989 for discharging sewage in inland waters/ public sewers and for land irrigation. For more details on water quality please refer Environment Audit Report.
3.4	Any problem with Management of Wastewater	No
3.5	Future Plan for Wastewater Management	Expansion of present STP/ Installation of additional STP
4	<b>Water Bodies in/around the Campus</b>	
4.1	Type of Water Body	Pond
4.2	Approximate Dimensions of Water Body	3 Acre Area and 20ft. Depth
4.3	Condition of Water Body	Eutrophicated (Please refer Annexure-III)
5	<b>Energy Management</b>	
5.1	Load Consumption at Various Department/ Institutes	Refer Annexure -IV
5.2	Energy Saving Measures Taken	<ol style="list-style-type: none"> <li>1. Energy Audit</li> <li>2. Display of Placards/Boards of Save Energy</li> <li>3. Installation of Solar Power Plants / Use of Renewable Energy</li> </ol> <p>Refer Annexure –IV for more details</p>
5.3	Whether renewable energy is utilized	Yes
5.4	If Yes, Type of Renewable Energy	Solar Energy
5.5	Capacity of Renewable Energy Plant	100 KW

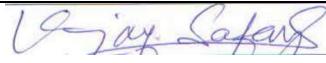
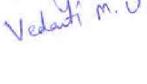
5.6	% Renewable Energy share	0.041%
6	<b>Ambient Air Quality</b>	
6.1	PM 10	27.2 $\mu\text{g}/\text{m}^3$
6.2	PM 2.5	13.38 $\mu\text{g}/\text{m}^3$
6.3	SOx	13.92 $\mu\text{g}/\text{m}^3$
6.4	NOx	2.39 $\mu\text{g}/\text{m}^3$
6.5	Quality of Ambient Air in Campus	Well within stipulated norms by NAAQS 2009
7	<b>Built-up Environment</b>	
7.1	No. of Buildings	61
7.2	Total Built up Area	1,57,245 Sq. M.
7.3	Total Land Area	120 Acre
7.4	% Built-up Area	32.5 %
7.5	Site Plan	Refer Annexure-V
8	<b>Green Belt</b>	
8.1	Total Number of Plant Species	250
8.2	Total Number of well grown Trees	38150
8.3	Area Under Green Cover	191455 Sq. m.
8.4	% Area Under Green Cover	39.42
8.5	Is indigenous Plant species available at campus, If yes please provide the details	Yes, Refer Annexure-VI for more details
9	<b>Biodiversity</b>	

9.1	Do you have green spaces / plantation around the building?	Yes
9.2	Types of Faunal Diversity found in campus	Animals, Birds, Insects, Plants, etc.
9.3	Number of different Faunal Diversity found in campus	Animals: 29 Birds: 48
9.4	Is there a wildlife pond?	No. Natural Pond available
9.5	Is there a log-pile or similar habitat for small mammals and insects?	Yes
9.6	Are there bird boxes / bat boxes?	Yes
9.7	Is there any Herbs/ Herbal Garden Available, Provide Details	Yes, Refer Annexure-VII
10	<b>Transportation</b>	
10.1	% Staff Members Travelling by Own Cars	35 % Refer Annexure-VIII
10.2	% Staff Members Travelling by Car Pooling	48%
10.3	% Staff Members Travelling by Bus/ Public Vehicle	10%
10.4	% Staff Members Travelling by Motorcycle/ Bike/ Scooter	8%
10.5	Average Distance Travelled by Staff Members	30 KM
11	<b>Green Agenda In Syllabus</b>	
11.1	% Teachers of CHARUSAT Emphasizing on Environment protection while teaching	87.7

11.2	Number of subjects dedicated for Environment Awareness/ teaching	Annexure-X
11.3	Is there any compulsory subject on Environment Awareness, If yes, give details	Yes, Environmental Sciences, Annexure-X
12	<b>Green Initiatives</b>	
12.1	Green Initiatives Taken up by University	Refer Annexure-XI
12.2	Recognition/ Awards received in the field of Environment	<ul style="list-style-type: none"> <li>• Gujarat Pollution Control Board Recognition as Schedule-I Environment Auditors,</li> <li>• NABL for Environmental Engineering Laboratory</li> </ul>
12.3	Details of Consultancy/ Research Projects Obtained in the field of Environment	Refer Annexure-XI
13	<b>Carbon Accounting</b>	
13.1	Carbon Footprint/Emission from Campus	20.73 Kilotons/ Year Annexure- IX
13.2	Carbon Absorption by Plants in Campus	6.78 Kilotons /Year Annexure- IX
13.3	Carbon Absorbed / Saved / Handprint / Campus	6.8 Kilotons /Year Well below average CF of Indian universities Annexure- IX
13.4	Carbon Footprint Per Person at Campus	2.62 Tons per person per Well below average CF of Indian universities Annexure- IX
13.5	Measures to reduce carbon emission	Expansion of Solar Power Plant in Planning Stage Energy Efficient Fittings Sensor Based Lighting System Switching to LED Lights

It is hereby declared that all the information submitted in and with respect to this format is correct and we will be responsible for any lapse regarding incorrect or incomplete information.

Name & Signature of all the members of Audit Team

S. No.	Name	Signature
1.	Dr. V. R. Panchal, Professor & Head, Civil Engineering, CSPIT	
2.	Mr. Vijay Safaya, Expert Member	
3.	Dr. Dipak Vyas, Ex-Professor, BVM Engineering College	
4.	Ms. Mitali Vedanti, Assistant Professor, Civil Engineering	 Mitali m. v.
5.	Mr. Gaurav Kapse, Assistant Professor, Civil Engineering	
6.	Ms. Hemal Parekh, Assistant Professor, Civil Engineering	

**ANNEXURE-I**  
**WATER MANAGEMENT**

**Water Consumption:**

In CHARUSAT, there are total 32 water tanks available at various locations. The details of the water storage tanks are as follows:

<b>Department/ Institute</b>	<b>No. of Tanks</b>	<b>Capacity in Liters</b>
ARIP	1	21363
MTIN	1	44156
CIVIL/MECH	2	56176
CMPICA	2	77974
HOSTEL-4	2	21805
HOSTEL-3	2	21805
HOSTEL-2	2	21805
HOSTEL-1	2	43146
PDPIAS	1	24838
COMPUTER/IT	1	28338
RPCP	1	28338
ADMIN	1	41963
CIVIL, H- 1,2,3,TAPAS, CMPICA	11	22000

MAIN TANK	1	175000
UNDERGROUND SUMP	2	131815
<b>TOTAL</b>	<b>32</b>	<b>760522</b>

### **Water Demand Calculation:**

Based on IS1172:1993, the following water demands are considered:

#### **Education Institution without Boarding Facility: 45 L/Capita/day**

Number of Staff & Students without In-house Hostel Facility:  $590 + (7299 - 2000) = 5889$

Water Requirement:  $5889 * 45 = 265005$  L/day

#### **Education Institution with Boarding Facility: 135 L/Capita/day**

Number of Staff & Students with In-house Hostel Facility: 2000

Water Requirement:  $2000 * 135 = 2,70,000$  L/day

**Total Approx. Water Consumption per day:  $265005 + 270000 = 535005$  L**

The water used for drinking purpose is supplied after subjecting it to the Water Purification system installed in various institutes/ departments.

The details of water purifiers installation are as follows:

# Charotar University of Science and Technology

## Water Purifiers

Sr. No.	Location	No.	Capacity in LPH	Location	Remark
01.	Univ. Admin	1.	100	Ground Floor (Account Side)	
		2.	100	First Floor ( Reading Hall)	
		3.	50	First Floor (Exam Section)	
		4.	07	Ground Floor (Pantry) Provost side	
		5.	07	Ground Floor (Pantry) Estate side	
02.	IIIM	6.	50	First Floor – Boy's Drinking Water Area (Room No. 214)	
		7.	50	First Floor – Girls' Drinking Water Area	
		8.	07	Ground Floor (Pantry - Room No. 120)	
		9.	07	First Floor (Pantry )	
03.	RPCP	10.	250	First Floor – Boy's Drinking Water Area (Room No. 219)	
		11.	07	Ground Floor (Pantry) Principal side	
04.	DEPSTAR Building	12.	500	Terrace	
		13.	10	Ground Floor (Pantry)	
		14.	10	First Floor (Pantry)	
05.	EE/EC Building	15.	500	Terrace	
		16.	100	Ground Floor (Workshop Side)	
		17.	07	Ground Floor (Pantry) Principal side	
06.	Civil/ Mech Building	18.	250	Second Floor – Boy's Drinking Water Area	2 ton Chiller
07.	PDPIAS	19.	250	First Floor – Boy's Drinking Water Area (Room No. 212)	
		20.	10	Ground Floor (Pantry - Room No. 105)	
08.	CMPICA	21.	50	First Floor – Boy's Drinking Water Area	
		22.	50	First Floor – Girls' Drinking Water Area	
09.	ARIP	23.	100	Second Floor – Boy's Drinking Water Area (Room No. 316)	
		24.	100	Second Floor – Girls' Drinking Water Area (Room No. 301)	
10.	MTIN	25.	100	First Floor – Boy's Drinking Water Area	
		26.	50	First Floor – Girls' Drinking Water Area	
11.	Girls Hostel - 1	27.	100	Second Floor (Near Room No. 66)	
		28.	50	Second Floor (Near Room No. 53)	
12.	Girls Hostel - 2	29.	50	Second Floor (Near Room No. 66)	
		30.	50	Second Floor (Near Room No. 53)	
13.	Girls Hostel - 3	31.	50	Second Floor (Near Room No. 66)	
		32.	50	Second Floor (Near Room No. 66)	
		33.	50	Second Floor (Near Room No. 53)	
		34.	50	Second Floor (Near Room No. 53)	
14.	Girls Hostel - 4	35.	100	Second Floor (Near Room No. 66)	
		36.	100	Second Floor (Near Room No. 53)	
15.	Girls Hostel Mess	37.	250	G, F	
16.	J c p Dining hall	38.	250	G, F	
17.	Canteen	39.	100	G, F	
18.	K D C C BANK	40.	250	WATER LAUNDER	2 ton Chiller
19.	CANTEEN SIDE	41.	250	WATER LAUNDER	2 ton Chiller

Numbering System: CHA/RO/01 to 41.



Fig 1: Typical display of placards for awareness on water usage

### Water Harvesting Potential

*Runoff Coefficient for Parks and pastures 0.05–0.30*

*Runoff Coefficient for Paved and Built-up Areas 0.9*

*Annual Rainfall of Anand District (mm) 773.6*

*Annual Rainfall of Anand District (m) 0.7736*

Annual fresh water volume received on campus through rainfall (cubic m) =

$$485623 \times 0.7736 = 375677.95$$

Surface Runoff generated from Built up area (cubic m) =

$$130945.23 \times 0.7736 \times 0.9 = 91169.31$$

Surface Runoff generated from Green Cover area (cubic m) =

$$342537.17 \times 0.7736 \times 0.3 = 79496.03$$

TOTAL surface runoff from campus =  $91169.31 + 79496.03 = 170665.33$

TOTAL water stored in campus lake (cubic m) =  $79496.03 \times 2.5 = 30351.50$

Total Ground Water Recharge from Green Cover =  $342537.17 \times 0.7736 \times 0.5 = 132493.37$

**Total Rain Water Harvested on Campus =  $30351.50 + 132493.3774 = 162844.88$**

**Percentage rain water harvested on campus =  $(162844.88 / 375677.95) \times 100 = 43\%$**

## ANNEXURE-II

### WASTEWATER MANAGEMENT

#### **Wastewater Generation & Management:**

Considering 80 % of water used gets converted to Sewage:  $0.8 * 535005 = 428004 \text{ L/day}$

The generated sewage is managed in following ways:

#### **a. Treatment of Sewage in Integrated Wetland Technology followed by discharge into CHARUSAT Pond**

##### ***Integrated Wetland Technology (IWT)***

CHARUSAT has installed a 100 KLD capacity Integrated Wetland System for CHARUSAT Girl's Hostel-4 Sites, as per details mentioned below.

Total Area	110 m <sup>2</sup>
Effective Area Overground	10 m <sup>2</sup>
Volume of Tank	270 m <sup>3</sup>
Cost of Installation	Rs. 8 Lacs

Benefits of the Treatment Technology:

- Odor Free
- No Chemicals
- Economical
- No O/M Energy
- Simple Design
- Sustainable
- Lower Footprint

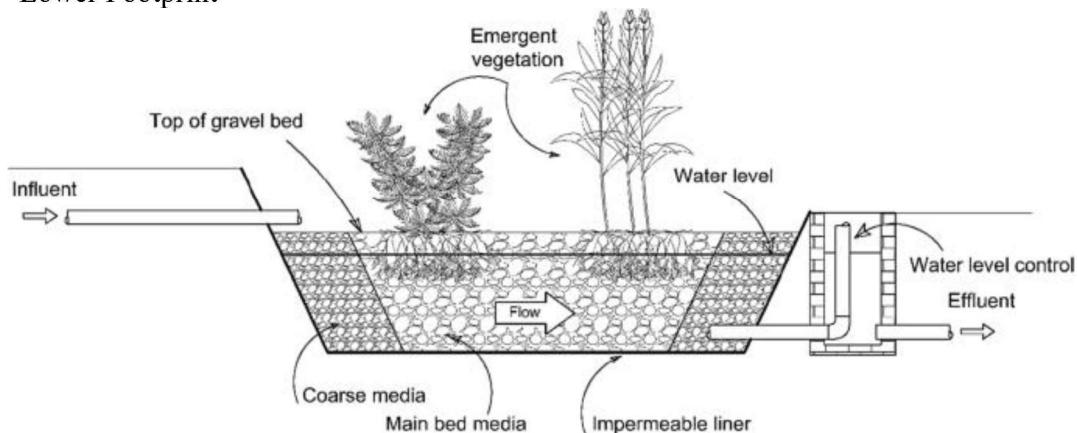


Fig 2: Cross sectional details of typical Integrated Wetland Technology



(A)



(B)

Fig 3 A and B: Integrated Wetland Technology of CHARUSAT

## Quality of Effluent / Sewage before and after treatment

Sr. No.	Parameter	Before Treatment	After Treatment
1	pH	7.68	7.88
2	Temperature $^{\circ}\text{C}$	33.3	32.4
3	TDS mg/L	713	681
4	EC $\mu\text{s}/\text{cm}$	1099	1048
5	COD mg/L	76.36	35.8432
6	BOD mg/L	14	12
7	Phosphates mg/L	0.02	BLQ
8	Nitrates mg/L	2.3612	N.D.

### b. Management of Sewage using Septic Tank/ Soak Pits

There are total 34 Soak Pits/ Septic Tanks installed underground for the final disposal and management of sewage generated from the respective buildings. The details of the construction of soak pit are as follows:

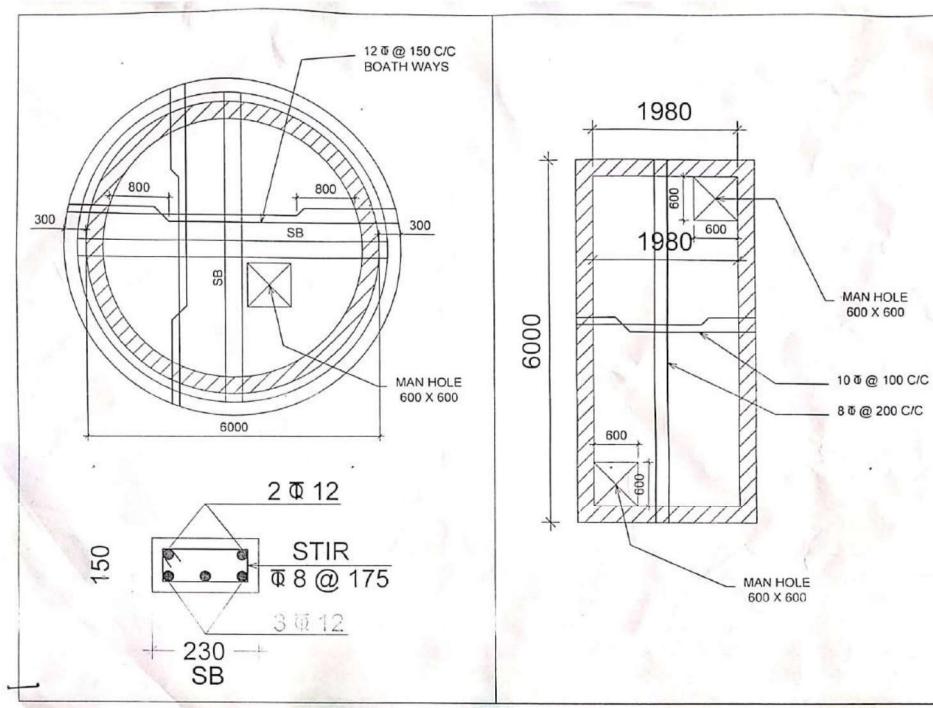


Fig 4: C/S details of Soak Pit/ Septic Tank constructed for Wastewater Management

The Location of 34 soak pits, Waste Water Sampling Points, Solid Waste disposal points are shown in below figure.

#### Final Disposal Point

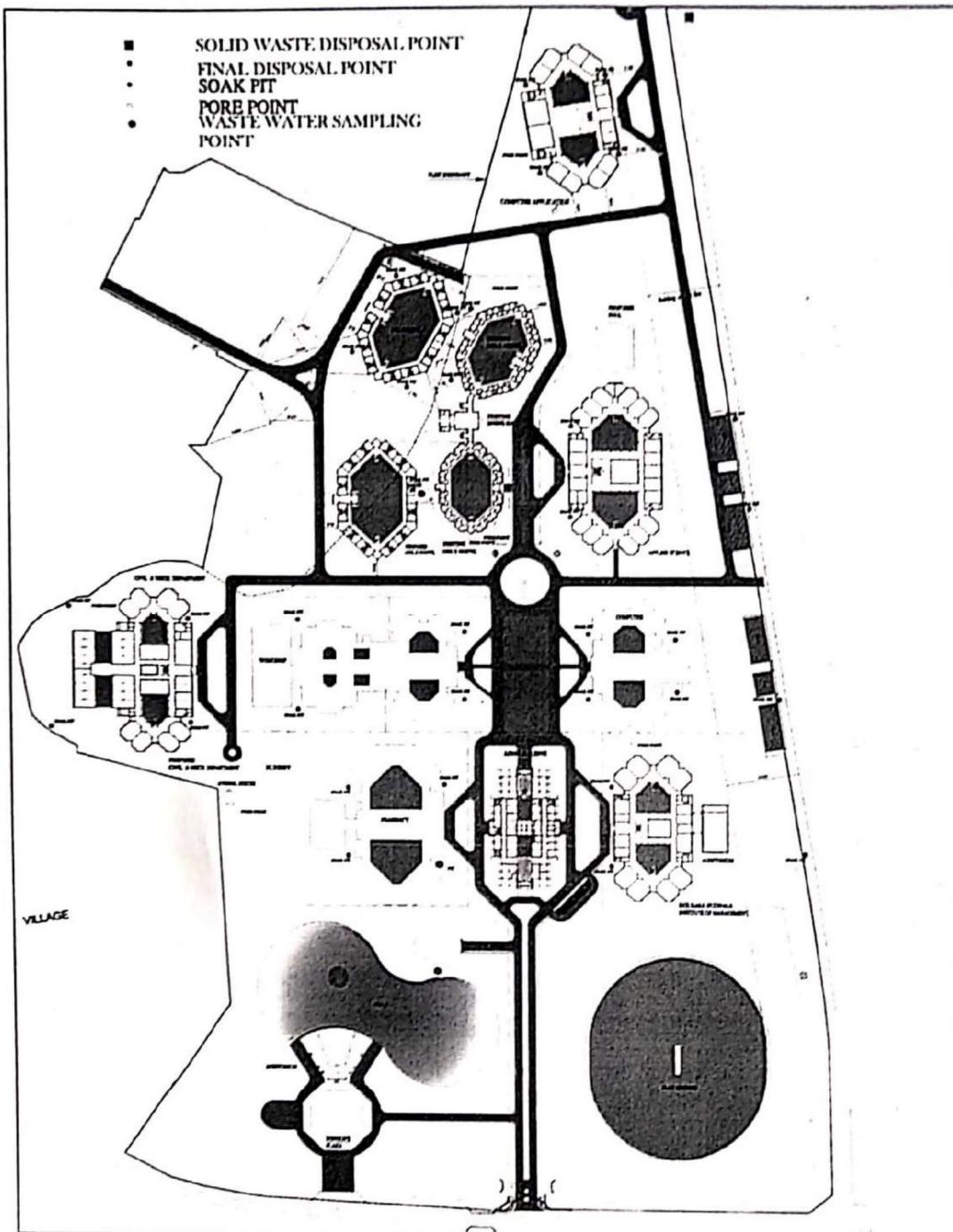


Fig 5: Site Plan of CHARUSAT mentioning location of Soak Pits/ Sampling points, etc.

## **ANNEXURE-IV**

### **WATER BODIES**

There is one natural water body/ pond of 3 Acre Area and 20 Ft Depth near the main entrance gate of CHARUSAT.



Fig 6: Natural Pond in CHARUSAT Campus

## ANNEXURE-IV

### ENERGY MANAGEMENT

CHARUSAT, in order to reduce its energy consumption has taken various steps such as:

- Energy Audit of CHARUSAT Campus
- Save Energy placards/ Posters/ Usage Instructions in each classrooms
- Installation of Solar Power Plant/ Panels at Campus

#### Energy Audit:

The primary objective of Energy Audit of CHARUSAT was to determine ways to reduce energy consumption per unit of product output or to lower operating costs. Energy Audit provides a "benchmark" (Reference point) for managing energy in the organization and also provides the basis for planning a more effective use of energy throughout the organization.

Load Consumption of CHARUSAT University for different loads:

LOADS	CONSUMPTION PER YEAR, KWH	USE IN PERCENTAGE
LIGHTING SYSTEM	303551	17%
FANS	261251	14%
AIR CONDITIONER	419084	23%
PUMPS	64156	3%
COMPUTERS	606300	33%
REFRIGERATION	91283	5%
WATER COOLERS	93555	5%
TOTAL	3683490	

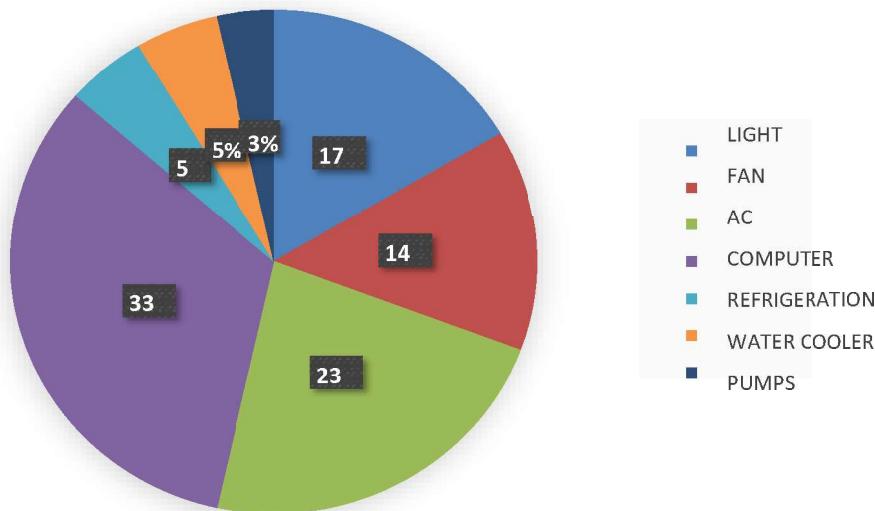


Fig 7: Electricity requirement distribution at CHARUSAT



Energy Audit data shows that the load consumption percentage of Major loads in CHARUSAT University.

- Computers consume the highest loads which is around 33 % of total load.
- ACs consume around 19 % of total loads.
- Lighting system consume around 14% of total load.
- Fans consume 12% of total load.
- Pumps, Refrigeration and water coolers consume equally around 4 % of total load.

Load Consumption of CHARUSAT University for different departments:

<b>Department/ Institute</b>	<b>Consumption KWH / year</b>
Electrical	109667.66
Civil	97331.14
Mechanical	89876.34
COMPI-IT	142846.15
EC	88701.66
DEPSTAR	1594803.93
I2IM	148309.56
Pharmacy	229181.3
MCA	286693
PDPIAs	146474.26
Admin	101194.3

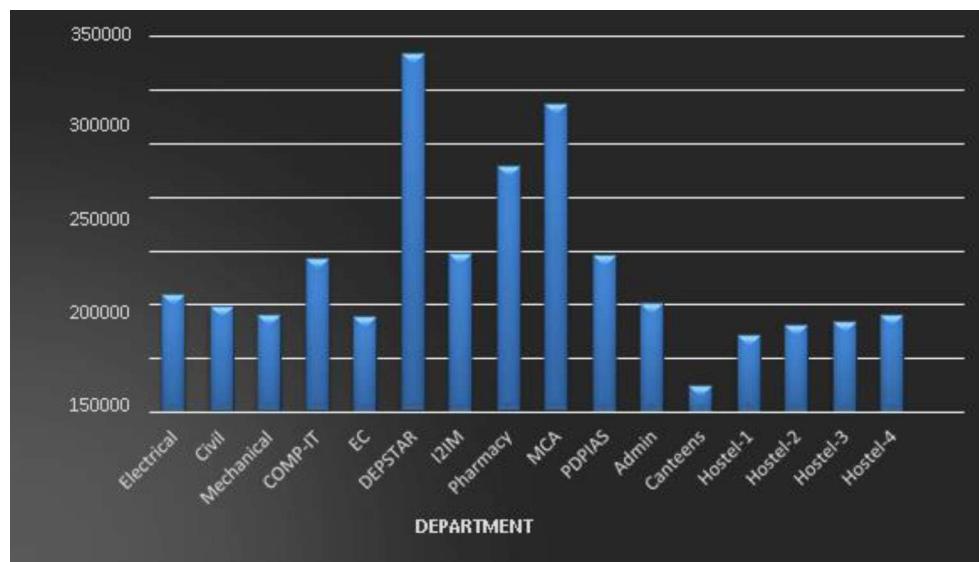


Fig 8: Institute/ department wise Electricity distribution at CHARUSAT



Fig 9: Save Energy placards/ Posters/ Usage Instructions in each classrooms

### Installation of Solar Power Plant/ Panels at Campus

CHARUSAT has installed a solar power plant on Mechanical/ Civil building terrace. Total 400 panels, each of 250 w rating are installed.

Total 5 inverters of 80 KVA rating each are employed in this plant. All generated energy has been transferred to MGVCL.

Highest power generated in month was 600 units. Presently average 500+ units per month electricity is produced using this power plant.



(A)



(B)

Fig 10 A & B: Solar Power Plant/ Panels Installed at CHARUSAT CL/ME Rooftop



## ANNEXURE-V

### BUILTUP AREA

CAMPUS LAND ALLOCATION		
Sr. No.	Institute / Department	Ground Floor Built up Area (Sq. Meters)
1	Central Administrative Building	2105
2	DEPSTAR (Building - 2)	3017.36
3	EE/EC (Building - 1)	4151.91
4	ME/CL (Building - 3)	4577.19
5	RPCP	4124.45
6	PDPIAS	4040.86
7	IIIM	3136
8	CMPICA	3076.99
9	ARIP	1748.61
10	MTIN	1815.73
11	WORKSHOP	1325
13	KKGH - 1	1000
14	JCPGH - 2	1150
15	CHARUSAT Girls' Hostel - 3	1448.57
16	CHARUSAT Girls' Hostel - 4	2210
17	Dining Hall - 1	392
18	TAPAS ANNAPURNA	740.34
19	CANTEEN AND GYMNASIUM	537
20	ANIMAL HOUSE	64
21	SHADE FOR LUNCH (NEAR CANTEEN)	304.7
22	OPEN AIR THEATER (TECHNOLOGY ZONE)	2800
24	MAIN PARKING SHADES (TECHNOLOGY ZONE)	2436
25	PARKING (MAIN ENTRANCE)	235
26	PARKING (RPCP)	766
27	PARKING (CSPIT)	250
28	PARKING (PDPIAS)	5224
29	PARKING (HEALTHCARE ZONE)	676



30	SHADE FOR LUNCH (BEHIND CE/IT BUILDING)	98
31	SHADE FOR LUNCH (BESIDE EE/EC BUILDING)	98
32	SHADE FOR LUNCH (BEHIND PDPIAS BUILDING)	77.1
33	SHADE FOR LUNCH (BEHIND IIIM BUILDING)	77.1
35	HT ELECTRICAL ROOM	62
36	MAIN GATE (E.C.C)	77
37	OVERHEAD TANK & WATER WORK CHANGE ROOM	237
38	CAMPUS ROADS	17235
39	CAMPUS STAGE-1 (TECHNOLOGY ZONE)	189
40	CAMPUS STAGE-2 (HEALTHCARE ZONE)	285
41	SANTRAM XEROX CENTER	30.66
42	STUDENTS STORE	66.61
43	ATM (AXIS BANK)	10
44	K.D.C.C BANK	26.48
45	SHREEJI XEROX	20
46	CANTEEN(SHREEJI)	537
47	MESS(JCP - PAPYLON)	550
48	AMUL PARLOUR	11.61
49	ICE BERG	76.65
50	NES CAFÉ	22.23
51	GIRLS HOSTEL STORE	13.38
52	KRISHNA CHAT	58.1
53	DANNY'S COFFEE BAR	70.1
54	TEA POST	72.93
55	LALABHAI SEVSAL	72.93
56	AMUL PARLOUR(HEALTH CARE ZONE)	11.61
57	SOVENIOUR SHOP	100



58	MAIN SPORTS GROUND	21978
59	DRINKING AREA NEAR CANTEEN	9.29
60	SPORTS GROUND TOILET	20.32
61	CAMPUS STAGE-3 (IIIM-TECHNOLOGY ZONE)	310
62	STAFF QUARTERS - 1	1195.42
66	HT ROOM 2(STAFF QUARTERS)	71
67	HOSPITAL BUILDING-H.T ROOM	584
68	HOSPITAL BUILDING-HVAC PLANT	1276
69	HOSPITAL BUILDING-STP TANK	790
70	HOSPITAL BUILDING-UNDER GROUND SUMP	788
71	HOSPITAL BUILDING-WARD	5000
72	HOSPITAL BUILDING-MAIN DIAGNOSTIC	6000
73	ROADS	17235
	<b>BUILTUP Sq. m.</b>	<b>128795.23</b>
	CAMPUS LAKE (SURFACE AREA) Sq. m.	12140.6
	DEPTH OF CAMPUS LAKE (M)	2.5
	<b>TOTAL LAND ACQUISITION(120 ACRE) Sq. m.</b>	<b>485623</b>
	<b>TOTAL BUILTUP Sq. m.</b>	<b>140936.53</b>

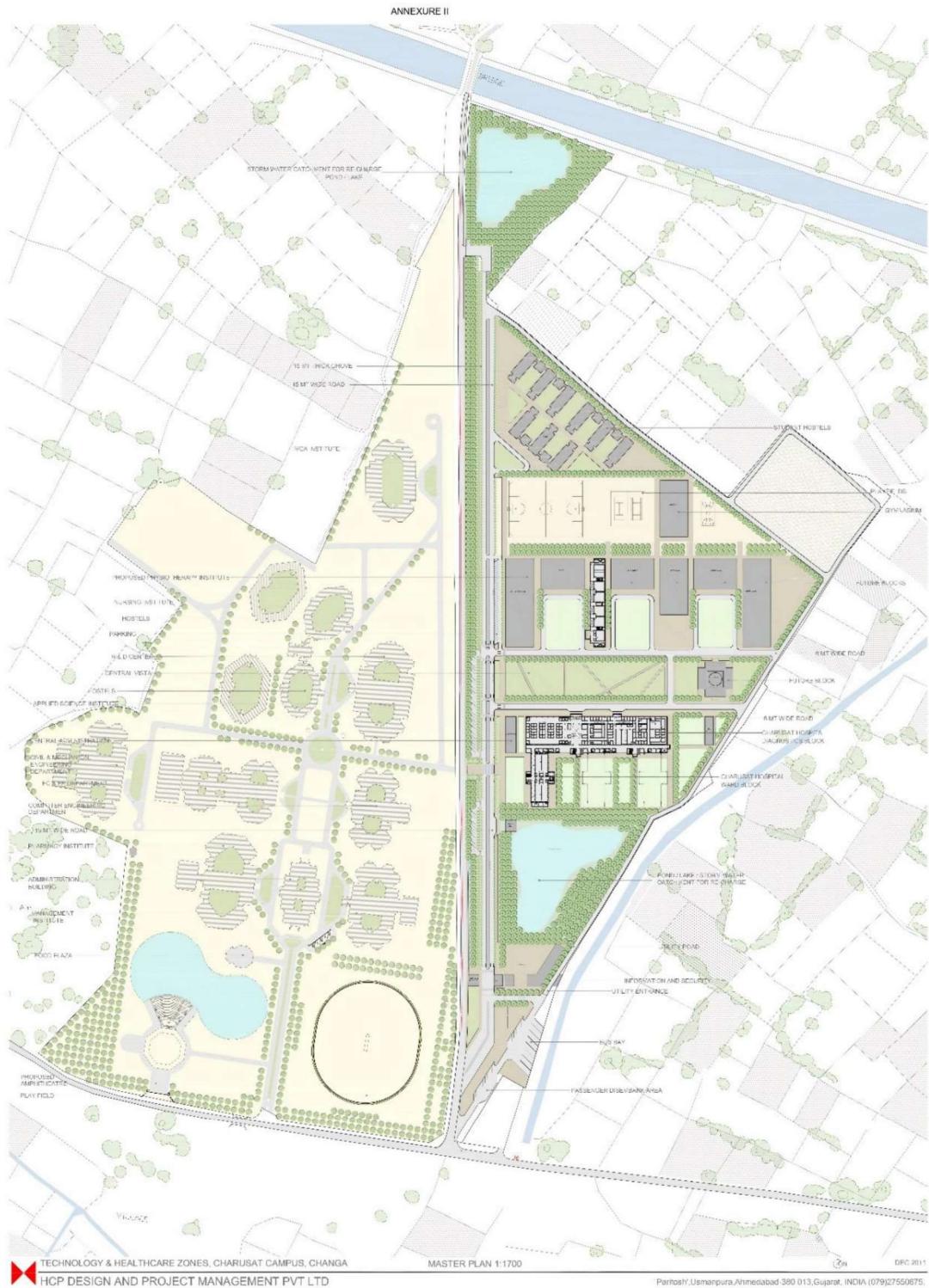


Fig 11: Site Plan of CHARUSAT Campus



## ANNEXURE-VI

### GREEN BELT

Total No. of Plants Species	250
Area under Green Cover in Sq. M.	344687.17
Total Area (120 Acre) in Sq. M.	485623
<b>% Green Cover</b>	<b>70.97 %</b>

### List of the Plant Species planted in Campus

Sr. No.	Names Of Plant Species In Campus
1	Ficush Big
2	Sicush Sunalis Big
3	Cicush Reguler
4	Lagestomiya
5	Foxtel Plam
6	Foxtel Plam
7	Foxtel Plam
8	Mashkarin Plam
9	Vichiya Mareli Plam
10	Litaniya Rubraplam
11	Traiengal Plam
12	Chimpation Plam
13	Travelers Plam
14	Travelers Plam
15	Travelers Plam
16	Aerica Plam
17	Bottal Plam
18	Bottal Plam
19	Bottal Plam
20	Bottal Plam
21	Adinium

22	Adinium Big
23	Kadam
24	Kadam
25	Lemdo
26	Rain Tree
27	Lagestomiya
28	Parsh Pipdo
29	Borsali
30	Tababiya
31	Coconut Big
32	Champa Big
33	Champa
34	Bouch
35	Chiku
36	Ambra
37	Limbu
38	Kamrakh
39	Dadum
40	Deshi Jamun
41	Parsh Jamun
42	Kesher Mengo
43	Jamfar
44	Sitafalm



45	Appele Boor
46	Jamrukhh
47	Fanush
48	Trendush Kentiya
49	Hejilono
50	Tikoma Kepanshe
51	Kena Daworf
52	Jashud Hawain
53	Play Mengo
54	Lentina Coper Bhura
55	Lentena Red
56	Shpinjre
57	English Ross
58	Vadeliya
59	Lemon Dornta
60	Tikoma Gavdi
61	Shpyder
62	Areliya White
63	Ficush Panda
64	Aulkata Shpinjari
65	Bogenwell Mix
66	Reban Grash
67	Yellwo Karan
68	Song Of India
69	Rusheliya
70	Engsture Foliya
71	Singoniyaum
72	Mani Plant
73	Yellwo Kachnar
74	Elominda New
75	Torpedo
76	Airnthouse

77	Day Lelly
78	Zed
79	Ecoforbiya
80	Ashpara Mile
81	Pinck Kachnar
82	Verygeted Tagar
83	Ixzora
84	Aclifa
85	Dornta
86	Red Mehndi
87	Eyepomiya
88	Eyepomiya Golden
89	Eyepomiya Bleck
90	Junifar Chinesh
91	Bhaji Red/White/Gren
92	Barbena
93	Corten
94	Paspun Lone
95	Semi Carpet Lone
96	Chosla Lone
97	Leela Majnu
98	Jashud Nana
99	Morning Glore
100	Jakomiya Masiya
101	Penda Hansraj
102	Ticoma Capensis
103	Acalipha Batic
104	Ixzora Hybrid Red
105	Minierekta Drawft
106	Thaspesia Drawft
107	Ficuss Panda
108	Rendonasia



109	Arelia Marble
110	Tabernaemontana Drawft
111	Hemelia Drawft
112	Song Of India
113	Dracena Bigdoll
114	Sittresia Purpuriya
115	Schefflera Verigated
116	Money Plant
117	Fountain Grass
118	H T Gulab
119	Plemengo
120	Pendenance Drawft
121	Dypsis Lutescens
122	Bogenwell Mix
123	Ficuss Safary
124	Conocarpas
125	Codiaeum Petra
126	Plumeriya Pudica
127	Dainela
128	Adenium Grafted
129	Monstera
130	Spethifilam
131	Leucophyllum Frutescens
132	Malfejia
133	Ixora Drawft Pink
134	Kesia Byflora
135	Arelia Drawft
136	Acalipha Try Colour
137	Tarpita Blue
138	Tabernaemontana Verigated
139	Angestifolia
140	Tradencasia

141	Heliconia New
142	Alocasia
143	Cena Drawft
144	Drasina Victoria
145	Sensiveria
146	Ixora Singapor
147	Acalipha Java
148	Codiaeum Laxmanrao
149	Braya
150	Zanzibar Gem
151	Faruceria
152	Semidora
153	Drasina Mahatma Gandhi
154	Jasud Hawain Orange
155	Bahomia Tomentosa
156	Goldem Bamboo
157	Acalipha Copper
158	Musanda
159	Tocoma Gaudichavdi
160	Asparagress Falkata
161	Arelia Green
162	Jasud Mini Marble
163	Galphimia Gracilis
164	Royal Palm
165	Hejilona
166	Ixora Drawft White
167	Drasina Ctc
168	Euphorbia Milli
169	Budhass Bamboo
170	Arelia Verigated
171	Codiaeum Catpan
172	Vadilia



173	Lemon Duranta
174	Bahomia Blackkaina
175	Alamanda Drwft
176	Karamda Drawft
177	Spider
178	Ribion Grass
179	Rushelia
180	Jestropha Drawft
181	Alamanda New
182	Eurphorbia New
183	Ljade Plant
184	Day Lilly
185	Signonium
186	Eranthemum
187	Asparagress Marry
188	Hibiscus Verigated
189	Moneyplant Golden
190	Plumeria
191	Adenium
192	Ipomia Black
193	Burbena
194	Muskarin Palm
195	Black Lilly
196	Damro
197	Nirenium
198	Rohelia Drawft
199	Aglonima New
200	Spingery
201	Baleria
202	Mayur Pank
203	Umrella
204	Kesia

205	Saru
206	Menihot
207	Parijatak
208	Tikoma Tent
209	Gulmehdi
210	Lilly Cha
211	Barmashi
212	Mogra
213	Jasud Lafranse
214	Jasmine
215	Penthalus
216	Murraya Paniculata
217	Tecoma Purple
218	Tanmania
219	Sinesia
220	Sudarson Lilly
221	Paras
222	Golden Road
223	Tabernaemontana Blue
224	Tikoma Smethai
225	Calendra Hybried
226	Russelia
227	Bamboo Grass
228	Snowbuss Drawft
229	Cufhiya
230	Plectranthus Scutellarioides
231	Lilium Longiflorum
232	Gardenia Jasminoides
233	Jasminum Multiflorum
234	Dastimilar
235	Sansiweria Drawft
236	Night Blooming Jasmine



237	Cestrum Diurnum
238	Lantana Camara
239	Caesalpinia Pulcherrima
240	Hemographics
241	Astechiya
242	Merenta
243	Flerodran Droen Golden

244	Scokeria
245	Adiantum Venustum
246	Eranthemum
247	Faruceria Pot
248	Royal Plam
249	Morraya Exotic
250	Euforbiya



Fig 12: Aerial View of Green Belt at CHARUSAT Campus



## ANNEXURE-VII

### BIODIVERSITY @ CHARUSAT

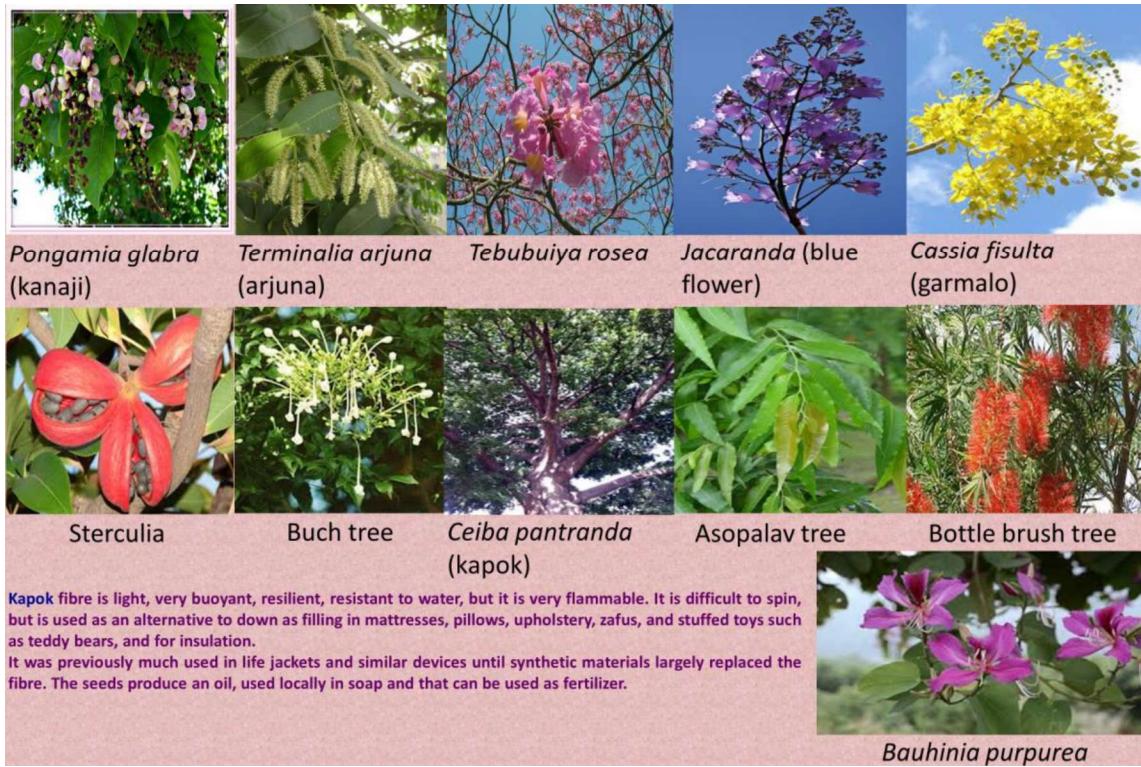
#### Plant Species



(A)



(B)



(C)



(D)



(E)



(F)



(G)

## Tree Treasure

Trees are the drivers of ecosystem. They enrich our environment by scrubbing out the toxic carbon dioxide from nature and releasing the beneficial oxygen.

CHARUST campus is a lush green one with its elaborated tree treasure ranging from historical Kailashpati tree and Kadam tree to medicinally important Neem Tree.



Kadam Tree



Kailashpati tree



Neem Tree

(H)



Allamanda cathartica      Double tagar tabernaemontana      Euphorbia milii      Euphorbia milii

Galphimia gracilis      Garden-tabebuia rosea      Gardenia jasminoides      Hibiscus brilliant

Hibiscus rosa sinensis      Thevetia nerifolia

**Pigments of flower:**  
Flowers get colors from the pigments called anthocyanin, which are in the class of chemicals called flavanoids.

(I)

**Bamboo-The Grass!!!!**

- Fastest growing plants of the world.
- Grows 3 feet within 24 hours.
- Higher compressive strength than wood, brick and concrete.
- Higher tensile strength that rivals steel!

- 1)Black Buddha
- 2)Buddha Bamboo
- 3)Elephant Bamboo
- 4)Golden Bamboo
- 5)Green Bamboo
- 6)Variegated Bamboo



(J)



The roots of lotus are planted in the soil of the pond or river bottom, while the leaves float on top of the water surface or are held well above it.

The flowers are usually found on thick stems rising several centimeters above the leaves.

Researchers report that the lotus has the remarkable ability to regulate the temperature of its flowers to within a narrow range just as humans and other warmblooded animals do.

And study has revealed that lotus flowers blooming in the Adelaide Botanic Gardens maintained a temperature of 30–35 °C (86–95 °F), even when the air temperature dropped to 10 °C (50 °F). The study, published in the journal Nature, about the latest discovery in the field of thermoregulation, heat-producing, lotus



Rudraksh Tree  
(K)



(L)



(M)

Fig 13 A to M: Floral Biodiversity- Plant Species in CHARUSAT Campus



## Animal Species



Female Nilgai



Male-Nilgai



Rabbit



Monkey



Squirrel



Anteater



*Mus musculus*- Mouse

**Mammals**  
Mammals are a particular class of animal. What makes an animal a mammal are several things. First, they must have glands that give milk. There are 3 types of mammals  
1. Mammals that give birth to live young  
2. Marsupials-carrying their young ones in pouch  
3. Mammals that lays eggs



(A)



*Ophiophagus hannah*-King Cobra



*Crotalus*- rattlesnake



*Ptyas mucosa*-Dhaman



*Chitalo- Khadchitalo-* Russel's Viper



Viviporous lizard-Bodibamni



Bengal Monitor-Patala gho



Noliyo-Indian gray mongoose



Chameleon- kachindo

Biodiversity @CHARUSAT



Common garter snake-water snake



Checkered keelback

### Reptiles

- They are cold-blooded
- Scales protect their bodies
- Very Few are **poisonous**
- Camouflage:Skin color alteration by concentrating or dissipating melanin is possible in many amphibians and reptiles.



Indian Boar



Sand Boa



Civet Cat



Insects are a class of invertebrates within the arthropod phylum that have a chitinous exoskeleton, a three-part body (head, thorax and abdomen), three pairs of jointed legs, compound eyes and one pair of antennae. They are among the most diverse groups of animals on the planet, including more than a million described species and representing more than half of all known living organisms. The number of extant species is estimated at between six and ten million, and potentially represent over 90% of the differing animal life forms on Earth. Insects may be found in nearly all environments, although only a small number of species reside in the oceans, a habitat dominated by another arthropod group, crustaceans.

#### Biodiversity @CHARUSAT

(C)

Fig 14 A to C: Faunal Biodiversity- Animal Species in CHARUSAT Campus



## Bird Species



(A)

**Ducks** are birds. Ducks are also called ‘Waterfowl’ because they are normally found in places where there is water like ponds, streams and rivers. Ducks are related to Geese and Swans.



(B)



The bodies of birds are covered with specialized structures known as feathers that grow out of the skin. No other animals has them. Feathers act as a barrier against water and heat loss, are light but very strong, and provide a smooth, flat surface for pushing against the air during flight. The feathers of most species have color, often bright and beautifully patterned



House sparrow



Kingfisher



Sunbird



Bee-eater



Woodpecker



Golden oriole

(C)

Great cormorant



**Guano- Cormorant's poop**  
It was a treasure for the Incas, the cause of a war, and once a backbone of Peru's economy.

**Now as the world hungers for sustainable resources, bird excrement is once again as prized as gold.**  
And a handful of islands of the Peru's Pacific coast are literally dripping in tons of one of its most historic treasures:guano.  
**Guano is rich in P, N and organic compound.**

Purple Heron



Purple Moorhen



Pond Heron



Northern Jacana



(D)



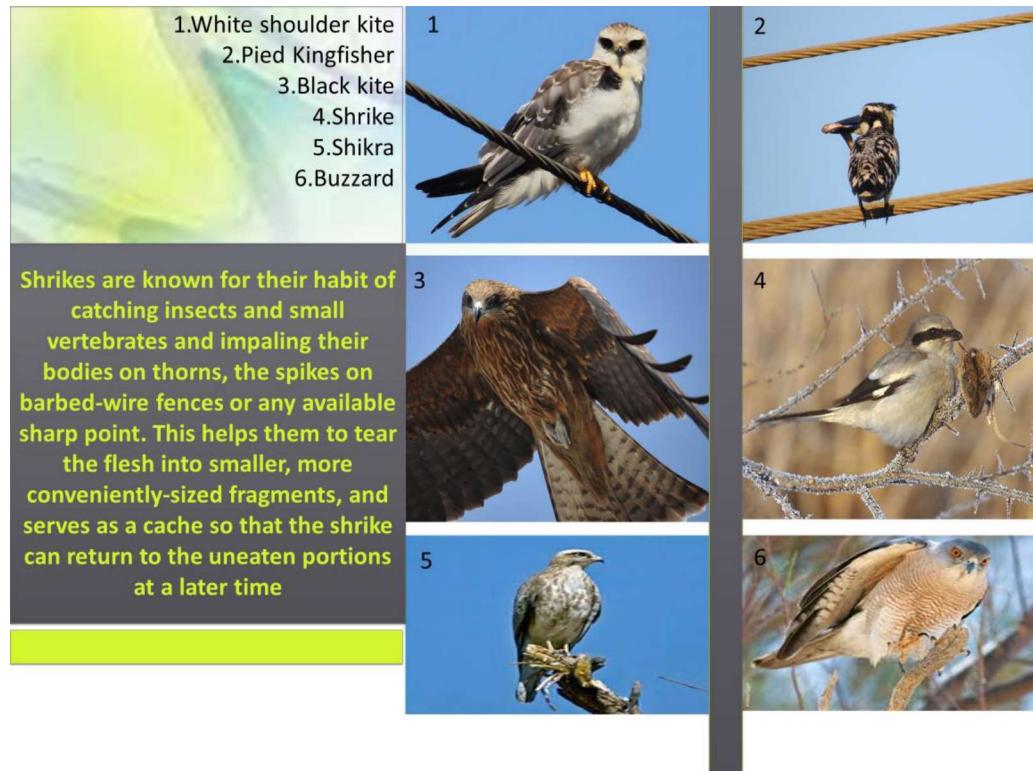
(E)



These birds have a preference for marshes, swamps, mud flats and shallow bodies of water, particularly wetlands - Commonly known as Wading Birds or waders



(F)



(G)



(H)

Fig 15 A to H: Faunal Biodiversity- Bird Species in CHARUSAT Campus



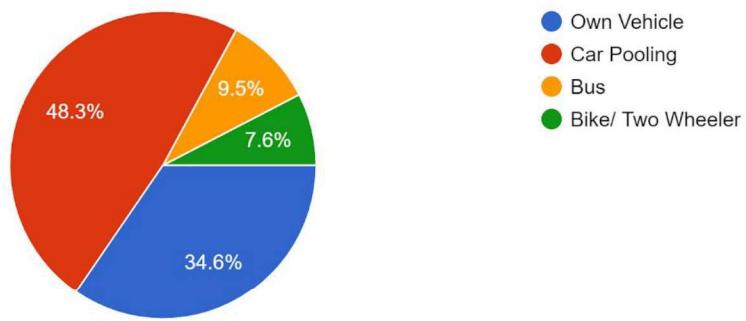
## ANNEXURE-VIII

### TRANSPORTATION

The online survey of the all employee of CHARUSAT was conducted and the inputs were taken on the details of the transportation or commuting mode of the employees from their point of residence to CHARUSAT.

How do you travel to Campus daily?

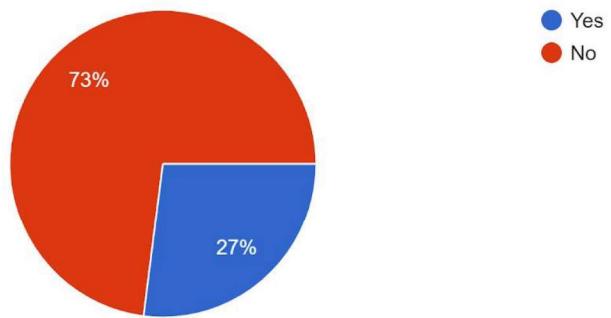
211 responses



(A)

Do you use Bicycles (In campus/ at home)?

211 responses



(B)

Fig 16 A & B: Chart mentioning Transportation details of CHARUSAT staff members



## ANNEXURE-IX

### GREEN AGENDA IN SYLLABUS

The M. S. Patel Department of Civil Engineering of CSPIT offers different courses in the field of Environment such as:

- Environmental Sciences (All Programs 1<sup>st</sup>/2<sup>nd</sup> /3<sup>rd</sup> Semester)
- Environmental Sustainability & Climate Change (All Program 3<sup>rd</sup> Semester)
- Basics of Environmental Impact Assessment (All Program 4<sup>th</sup> Semester)
- Air Pollution and Control (Civil-5<sup>th</sup> Semester)
- Environmental Engineering-I (Water Supply Engineering, Civil 6<sup>th</sup> Semester)
- Environmental Engineering-II (Wastewater Engineering, Civil 7<sup>th</sup> Semester)
- Environmental Pollution & Control (Focusing on Industrial Pollution Civil -7<sup>th</sup> Semester)

**SDG Handprint Lab:** Over the next twelve years, youth need to be key drivers for the successful implementation of the SDGs. It is vital to raise awareness about the 17 SDGs, their targets and the 2030 Agenda for Sustainable Development among youth, build a platform for discussion, and create conditions for their active engagement. The SDG Handprint Lab designed for Higher Education Institutions is an initiative in this direction. It aims at familiarizing students with SDGs, facilitating development of understanding their significance and getting them to take action at the local level.

The overall approach and strategy of the laboratory will be based on the goals, targets and indicators of

the Sustainable Development Goals. The programme involves seven steps.

- Orientation to SDGs, Handprint and the Programme
- Selection of the SDG Targets
- Investigation (Baseline study)
- Developing Project Strategy and Plan of Action
- Handprint Action in the community
- Impact Evaluation & Project Report
- Evaluation, Certification and Exhibition

**NABL Accredited Environmental Engineering Laboratory:** The Environmental Engineering Laboratory of M. S. Patel Department of Civil Engineering, CSPIT has been accredited in accordance with ISO/IEC 17025:2005 by the National Accreditation Board for Testing and

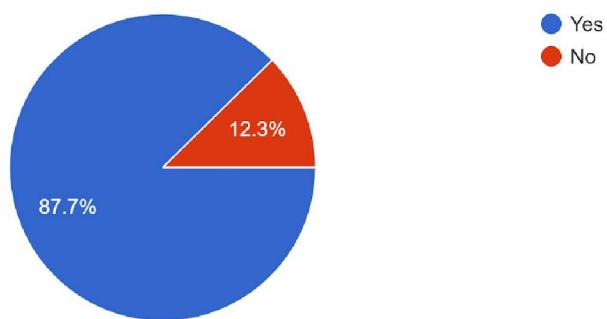


Calibration Laboratories-NABL India in the field of Chemical testing (Water/ Wastewater/ Ambient Air/ Stack Emission/ Hazardous Wastes/ Noise) with total accredited 60 tests/ parameters. The accreditation is granted for two years and is valid till 25.11.2020.

In the survey conducted for CHARUSAT teaching staff, 87.7 % teaching staff responded that they emphasize on environmental awareness while teaching their subjects

Do you emphasize on Environment Awareness/ Protection while teaching your subjects?

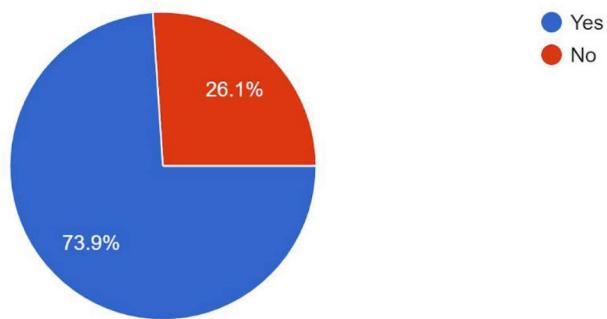
211 responses



(A)

Do you participate in extension activities related to Environment/ Nature?

211 responses



(B)

Fig 17 A & B: Chart mentioning Environmental Initiatives by Faculty Members



## **ANNEXURE-X**

# GREEN INITIATIVES BY CHARUSAT

CHARUSAT strives to provide a unique learning environment that involves understanding of the Environment Protection and relating it to issues of a local area and using student's skills and knowledge to conduct research and executing Best Environmental Practices.

CHARUSAT has always been supportive of design and to explore the intersections of environment and learning for developing responses and interventions to advance the wellbeing of both students and the environment. This initiative has involved staff members and students of different institutes. Teachers and their students can play a unique role in advancing knowledge of environmental problems and engaging the wider college and social community to address these challenges that affect the lives of all. The various initiatives profiled here provide opportunities for innovation, research, analysis, and partnership, and it is expected that not only that they will be sustained at the CHARUSAT campus, but that they will help to inspire similar efforts on other campuses in the years to come.

#### *A) Tree Plantation Drives*

બુધવાર, તા. ૩-૭-૨૦૧૯

नया प्रसार

ચાર્ટસેટ-હરિયાળા કેમ્પસમાં વિદ્યાર્થીઓ દ્વારા પૃક્ષારોપણ

यांगा, ता. २  
पथविराजनी अगवाड़ी  
माटे विधायिकामोंमां अजूनि  
इंकरवाना देतुसर चाहुंसेट  
युनिनस्तीती यांगाना लियाणा  
श्रीन कंपसामो मंजगवारे  
कृष्णरोपणाना काठिकम  
पोजावामो आयो लतो.  
यांगोलामो आयो लतो.  
यांगोलामो सोनी सतावीस पाटीदार  
केळवाकी मंडणाना उपप्रभुम  
दी. ओ. पटेव, चाहुंसेटना  
प्रोवेस्ट दो. पंकज जोशी,  
सलमंती धीरुबाई पटेव,  
मानुसंस्थाना भजनाची  
आर.ली.पटेव, ऐलवाइअर दो.  
बी.ज. पटेव, राज्यस्त्रां दो.  
देवांगोलेशी, डेळवाडी मंडणाना  
लोडारो - सच्चये, विल्डिंग  
कमिनीना सच्च दी.अंत.पटेव,  
महेश्वरीही पटेव, पतलीबेन  
पटेव नाना दस्ते कृष्णरोपण  
करवाना आयुं दांतं

चाहुंसेट कंपसामो छोडा बे  
पर्याप्ती वसावांगोला काठिकम



योजनामां आवे छ. दिवायाना  
चार्टरेट के मध्यमां  
मंगलवारेचार्जस्टेट्ना २०० थी  
वधु विधार्ती बाई-बहनो द्वारा  
द्वाराप्राप्त करावां आव्यु लान्  
अप्रसंगे १५० थी वधु  
विविध प्रकाशन रोपा लेवा ले  
बीमो, बदाम, गुब्बोलो, बाला,  
बोरसवी, सड़, अमाला,  
सरगोन, गुंदा, जानु, मोसवी,  
ऐपलबोर, डेरी, लीनु, आदि  
आमधी इम नीवर्गी यांगा

વગેરેદોપવામાંબાયાદતા.  
ઉક્કેખાતીય છે કે ચાલુસેટ  
ક્રમસમાં ૩૫૦૦૦ થી વધુ નુંઠો  
છે જેમાં ૩૦૦ થી ૪૦૦  
પ્રકારના વિનિયોગી વુંઠો,  
હુલ-છુલ રોપા - વેબાથી  
ચાલુસેટ ક્રમસ લિટિયાનું બન્યું  
છે. અને ૩ કરાણલાં ગુજરાત  
સરકાર અને વિનિયોગવિરાસ  
સંસ્થાઓ દ્વારા ચાલુસેટની ગૈન  
ક્રમસનો એનોઈસ સતત મળતો  
રહ્યો છે.

**Nav Gujarat Samay**

04-07-2019

यांसेते केअसमां 200 विधार्थी द्वारा 150 उपरांत वैविध्यपूर्ण छोटवा रोपवामां आव्या



આર્ટસેટ કેમ્પસમાં 75000થી વધુ વક્તો છે આણંદ :

જાળવી માટે વિદ્યાર્થીઓ જાગૃત કોલાબાળા છેઠસર ચંગા સિદ્ધય ચારસેટ ચુંબિલીની ગીત કેમ્પસમાં વૃદ્ધારોપણની કાર્યક્રમ યોજવામાં આવ્યો હતો. ચોરોડ મોટી સાતાવીસ પાઈએટ કોંગળી મંજળા ઉપરમાનું સી.એ.પેટે, વારસેટન પ્રોફેસર ડૉ.પંકુ જોણી, લખાંગી રીતુભાઈ પટેલ, મારૂંકસાણા લાલાંની આર.ડી.પેટે, મદેલાઈક ડૉ.ની.એ.પેટે, રિચર્ડ કમિન્સાન સાચ્ય સી.એ.સ. પેટે, મદેશબાઈ પેટે, પલ્ટાનીલેન પલ્ટાના હિસે વૃદ્ધારોપણ કરવામાં આવ્યું. ચારસેટ કેમ્પસમાં છલ્લા લે તરીછી વૃદ્ધારોપણ કાર્યક્રમ યોજવામાં આવે છે. દરિયાના વારસેટ કેમ્પસમાં ૨૦૦૩૦ વર્ષ વિદ્યાર્થીઓની દ્વારા વૃદ્ધારોપણ કરવામાં આવ્યું હૈ, જેમાં પણીએ વર્ષ વિદ્યાર્થી પ્રકાશન રોપા જેણા કાલોસ, નાદમ, ગુલાબોની, પોરાસીની, ચાદર, અમદારા, સારાંશ, ગંદું, જાખું, પેપલાંબ, કરી, લીનું, પાટી આમદારી, કદમ, નાનાંગીની, ચંપા વર્ગની રોપાવામાં આવ્યા હતા. ઉલ્લેખનીય છે કે વારસેટ કેમ્પસમાં ૩૦૦૦૦૩ી વધુ વૃદ્ધી જેમાં ૩૦૦૩ી ૪૦૦ પ્રકાશન પેપિયની વૃદ્ધી, કાલ છાડ્યો - હેઠાં વારસેટ કેમ્પસના વિદ્યાર્થીઓની જીવિતની વિધાની વિશેષતાઓ અનુભૂતિ હોય. આંતિક પરાવર્તિયા સંસ્કૃતોની દ્વારા ચારસેટની ગેણી કેમ્પસની એનોઈ અનોખા કરવામાં આવેલો હૈ.

(A)

(B)



## Divya Bhaskar

અમદાવાદ • બુધવાર, 3 જુલાઈ, 2019 | 2

પર્યાવરણ જાગૃતિનો સંદર્ભો ફેલાવવા પ્રયાસ  
ચારુસેટ કેમ્પસમાં 200થી વધુ  
વિદ્યાર્થીઓ દ્વારા વૃક્ષારોપણ  
કેમ્પસમાં છેલ્લા 2 વર્ષથી વૃક્ષારોપણ થાયછે



બાકર બજાર / આરાંદ

આર.વી.પટેલ, મહેશાંનાઈ  
પટેલ, પલ્ટલોનના  
પર્યાવરણની જાળવણી માટે  
હક્કે વૃક્ષારોપણ કરાયું હતું અને  
વિદ્યાર્થીઓની જાળવણા  
કેમ્પસરંગાં હેતુસર  
ચારુસેટ કેમ્પસમાં આવ્યો હતો.  
ચારુસેટ વૃક્ષારોપણ કાર્યક્રમ યોજનામાં આવે  
છે. હારિયાણા ચારુસેટ કેમ્પસમાં  
મનજિયારને ચારુસેટ 200 થી  
વધુ વિદ્યાર્થી બાઈન્ડ-અનો દ્વારા  
વૃક્ષારોપણ કરવામાં આવ્યું હતું.  
આબ્યો હતો. શ્રી ચેતત મોટી  
નેંબા 150થી વધુ વિવિધ ક્રકોણાના  
સતતીસ પાઠીદાર કેળવણી  
રોપા જેવા કે લીમધો, બદામ,  
મંજના ઉપર્મૂખ રીતે. પટેલ,  
ચારુસેટના મેંબરોનાં હોંકાર, પંકજ,  
જોશી, સહમતી વિદ્યાર્થી  
પટેલ, માતૃસેસ્થાના જાળની  
વંધા વગેરે રોપવામાં આવ્યા હતો.



ચારુસેટ  
યુનિવર્સિટી

ચોંગાં

અંગાં

લાટિયાણ

ચોંગાં

જુવાન

ચોંગાં

&lt;p



### **C) Digital Paperless Examination**

**આણંદ કુકે**  
ચુનિવર્સિટીનો પર્યાવરણ બચાવલક્ષી મહત્વનો નિર્ણય

# ગુજરાતમાં સૌપ્રથમ પેપરલેસ ડિજિટલ પરીક્ષાઓ શરૂ કરવામાં ચારુસેટ અગ્રેસર

(A)

Divya Bhaskar 24-09-2019

સિંગાપોર સ્થિત કંપની લિટલમોર ઈનોવેશન લેબ્સ વચ્ચે MoU : 14મી નવેમ્બરે 2400 છાત્રોએ પદ્ધતિના સાક્ષી બનશે  
**રાજ્યમાં સૌપ્રથમ ચારુસેટના વિદ્યાર્થીઓ પેપરલેસ પરીક્ષા આપશે**

હવે.. ચોરીનહીંથાય  
કારણ છે ‘ઇ-ટેબલેટ’

મૂલ્યાંકન પણ કલાર્ડ  
પ્લેટફોર્મ માર્ક્યુટે થશે

ઉત્તરાધીઓ, પ્રશ્નપત્રો,  
હોલ ટિકિટમાં વપરાતાં  
કાગળો બયથે

બોલ્ડર સ્કુલ | લાન્ડાંગ

पेटवाहना यांगा स्वित वयोदत् पुरुषा  
सामाजिक मेन टेक्नोलॉजी द्वारा बैपास  
तम्भम् परिवर्तयो लेखनी प्रैपरेशन द्वारा  
वैवाहि निर्विक वृक्षामाला आयो कि. से  
ऐसे कि एक वृक्षामाला वृक्षामाला पुरुषों  
सिंहासन द्वारा अक्षी रखी कि. ऐना भाग वृक्ष-  
प्रकाशन, लाल टिकिटांग वृक्षामाला पै  
अनेक वृक्षामाला वृक्षामाला आयो कि. से  
अनेक वृक्षामाला लकड़ी वृक्षीय हो रही.  
पढ़नी वृक्षामाला वृक्षामाला लकड़ी वृक्षीय हो रही.  
तापिकामाला वृक्षामाला वृक्षामाला अनेक  
कृषि विकासामाला वृक्षामाला लकड़ी वृक्षीय  
हो रही. पढ़नी वृक्षामाला वृक्षामाला लकड़ी वृक्षीय



700 परीक्षाभां थતો 3.6.50 લાખનો ખર્ચ બયશે

ગેણેરેશન માટે 24

શિક્ષણ માટે

જ્ઞાન અપવાના છાપણ

● 24 જીસ કાપવામાં આવે છે, તેમજ  
એવી રીત્યા પણ નિયમો ને લેવું જરૂરી હશે.

ખાના લિટર ચાસ્ટાના પરિણામ થાય છે.  
જોકે, પુનિવર્તિટીના નિર્માયધી કેટલાંય

କେତେ କୁପାଳା ଅର୍ଥରେ ଅନେ ପାଞ୍ଜିନୀ ଅର୍ଥରେ  
କୁପାଳା କୁପାଳା ପଟେଲୁ କୁପାଳା କୁପାଳା

隨處可見

(B)



# Nav Gujarat Samay

24-09-2019

# પેપરલેસ ડિજિટલ પરીક્ષા..

નવગુજરાત સમય > આણંદ

इसे परीक्षा पेनली तथा पक्ष विवादधियों अंगठीया-  
टेक्स अपेक्षा, परीक्षामान प्रभागों आने उत्तरवाली बदली  
जा सकती है। इसमें चारों पक्षों की बातों का विवाद विडिट्री  
होने पर विवाद सुनिश्चीय तथा विवाद परेक्षण विडिट्री  
हो जाएगा। याथे इसके बाहर चारों पक्षों के विवाद  
दर्शावाना रहेंगे। यादृच्छा में विवाद प्रो-पक्ष और जीर्णी  
दर्शावाना रहेंगे। यादृच्छा में विवाद प्रो-पक्ष की दारा विडिट्री  
एक विवाद अंगठीयानेशन अंगठीयानेशन अभियान  
नहीं बल्कि अपनी विवादीयानों का विवाद करेंगे।  
समाजीकरण कर देखायान विवाद पुनर्विशिष्टीना  
रिक्विसिटी रोडवेज जीर्णी, अंगठीयानेशन मशोद परेक्षा,  
प्रो-पक्ष, जीर्णी, ठी-पर्सन्स विवादाना भी, अंगठीयानेशन  
तथा अंगठीयानेशन सेक्युरिटी अंगठीयानेशन सेक्युरिटी  
क्रियामान आया था।

For more information about the study, please contact Dr. Michael J. Hwang at (319) 356-4000 or email at [mhwang@uiowa.edu](mailto:mhwang@uiowa.edu).

A photograph showing three men standing side-by-side, each holding a large, open certificate or document. The man on the left is wearing a dark blue shirt and light-colored trousers. The man in the center is wearing a black shirt and light-colored trousers. The man on the right is wearing a light blue shirt and dark trousers. They appear to be at an indoor event, possibly a graduation or award ceremony.

## ચાર્સેટ યુનિવર્સિટીની પહેલ ..પરીક્ષામાં પ્રશ્નપત્ર-ઉત્તરવહીના બદલે ઇ-ટેલેકોમનો ઉપયોગ થશે

ଆମ୍ବାନୀ ଉତ୍ତରେ ମୁହଁଯାଙ୍କ କଟାଇ  
ପେଟକ୍ଷେମ ମାରକ୍ତ ଆନିଲାଇନ ଥିଲେ  
ଫିନିଟର ପରୀକ୍ଷା ଅନ୍ତର୍ଭାବରେ ଆପେବା  
ଉତ୍ତର ମୁହଁଯାଙ୍କ ପାଇ କାରିଗର ଖେଳ ଦୂର୍ଦ୍ଵାରା  
ଆନିଲାଇନ ଥିଲେ, ଏ ନାହିଁ ବୁନିଯଦିତ ପାଇଦାନା  
ଜାଗର୍ଣ୍ଣ ହୋଇ ପାଇଲା, ପରିଚାଳା କରେ  
ବୁନିଯଦିତ ପାଇଦା ପାଇଲା ବିଶ୍ଵାସରେ ବୁଦ୍ଧି  
ଶୁଭ ଥିଲେ, ପରିଶକ୍ଷଣେ କେତେ ମୁହଁଯାଙ୍କନୁ ପାଇ  
ଦିନକୁ ଛାନ୍ତି ନିର୍ଭାବ କରାଯାଇ  
ଯୁଗମାନା ପାଇ ଉତ୍ତର ରହାଯାଇ ଥିଲେ,

**ચારુસેટ ચુનિવર્સિટી અને કિંગાપોર્ની લિટરારોર ઇનોવેશન સેબ્સ કંપની વયે MoU**

**શૈક્ષણિક રસાફ, પિધાર્થાઓ માટે તાલીમ વર્ગ અને ડેમો રખાશે**

ચારુસેટ ચુનિવર્સિટીના પરોફેન્શિન સુધી રાત્રા એન્ડ દાદા પરોફેન્શિન લાગાડ પ્રોફેન્શિનો સમયાનુસાર હોય રહ્યામાં આવે છે. જેણા કાર્યક્રમે પરોફેન્શિને પરોફેન્શિન પરોફેન્શિને સમયાનુસાર પ્રાપ્ત થાય છે. આ ઉપરાં ટ્રાન્ઝિફર્ડ તથા પોરિન્ટિંગ ડિઝિન્યુનિવર્સિટી પરોફેન્શિન પ્રમાણિત પણ રિફરાલ્યુનિવર્સિટીને પરોફેન્શિનના લાભી અને છે. પોરિન્ટિંગ ડિઝિન્યુનિવર્સિટી એક્સામનિલાન કિસ્કેનના અન્નાનીકાળમાં રસાફ અને વિશેષ કાર્ગો વિશેષાળમાં આપાયેલ અને લાભ આપાયેલ હોય. લાભ અને એક્સામ 2019માં કિસ્કેન એનોવેશન રસાફ અને દાદા પારોફેન્શિનો માટે વિશેષ કાર્ગો વિશેષાળમાં આપાયેલ અને લાભ આપાયેલ હોય. લાભ અને એક્સામ 2019માં કિસ્કેન એનોવેશન રસાફ અને દાદા પારોફેન્શિનો માટે વિશેષ કાર્ગો વિશેષાળમાં આપાયેલ અને લાભ આપાયેલ હોય.

(C)

Fig 20 A to C: CHARUSAT in News-Digital Paperless Exam

## **Benefits of Paperless Digital Examinations**

Considering one student undergoes Four Internal Exams and Two End Semester University Exam.

Paper required in traditional Exam system: 8 Pages Answer Sheet for Internal Exam and 24 Page Answer Sheet for University Exam

Total Paper Required for Exams Per Year =  $[(8*4) + (24*2)]$  \* Number of Student Appeared

For AY 2018-19:

Number of students appeared the Digital Paperless Exam in AY 2018-19: 2400

Total Paper Required for Traditional System of Examination:  $[(8*4) + (24*2)] * 2400 = 192000$

Around 1 Ton of Papers saved

The average amount of water used to make one piece of A4 paper is more like 10 L.

Saving in terms of Water Usage:  $192000 * 10 = 1920000$  L = 1920 KL of Water

Saving in terms of Money:  $192000 / 500 = 384$  Paper rims (Approx.) =  $384 * \text{Rs. } 300$

= Rs. 1.15 Lacs

#### Savings in Terms of Trees to be cut:



One tree makes 16.67 reams of copy paper, or 8,333.3

$$= 384/16.67 = 23.035 = 24 \text{ Trees}$$

### **For Upcoming Years:**

The Digital Paperless Exam will be implemented in all Institutes and for all students in phase wise manner.

Total Paper Required for Traditional System of Examination:

$$= [(8*4) + (24*2)] * \text{Total Students Enrolled}$$

$$= [(8*4) + (24*2)] * 7299$$

$$= 583920 \text{ Nos}$$

= Around 2.6 Ton of Papers saved

The average amount of water used to make one piece of A4 paper is more like 10 L.

Saving in terms of Water Usage:  $583920 * 10 = 5839200 \text{ L} = 5839.2 \text{ KL of Water}$

Saving in terms of Money:  $583920/500 = 1167.8 \text{ Paper rims (Approx.)} = 1167.8 * \text{Rs. } 300$

$$= \text{Rs. } 3.5 \text{ Lacs}$$

Savings in Terms of Trees to be cut:

One tree makes 16.67 reams of copy paper, or 8,333.3

$$= 1167.8/16.67 = 70.05 = 71 \text{ Trees}$$



## D) Organizing workshops, training programs and Knowledge Sharing

**Chief Patron:**  
Shri. Surendrabhai Patel, President, CHARUSAT

**Patrons:**  
Dr. M. C. Patel, Secretary, Kelvani Mandal  
Dr. Pankaj Joshi, Provost, CHARUSAT

**President:**  
Dr. A. D. Patel, Principal, CSPIT

**Program Chair:**  
Dr. Amit Ganatra, Dean, FTE

**Program Convener:**  
Dr. V. R. Panchal, Professor & Head, M. S. Patel Dept. of Civil Engg.

**Program Coordinators:**  
Dr. Hiteshri K. Shastri and Mr. Gaurav Kapse  
Asst. Professors, M. S. Patel Dept. of Civil Engineering, CSPIT

**How to Reach**

**One Day Workshop on "Towards Climate Resilient India"**

**By**  
**Dr. Auroop Ganguly**  
Professor, Dept. of Civil & Environmental Engineering  
Director, Sustainability and Data Sciences Laboratory  
Northeastern University, Boston, USA

**31<sup>st</sup> July, 2018**

**Convener:** Dr. V. R. Panchal    **Coordinators:** Dr. Hiteshri K. Shastri & Mr. Gaurav Kapse

**CHARUSAT**  
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Organized by:  
M. S. Patel Department of Civil Engineering,  
Chandubhai S. Patel Institute of Technology [CSPIT],  
Charotar University of Science and Technology [CHARUSAT],  
CHARUSAT Campus, Changa - 388 421, Dist: Anand (Gujarat)

Fig 21: Workshop on Towards Climate Resilient India

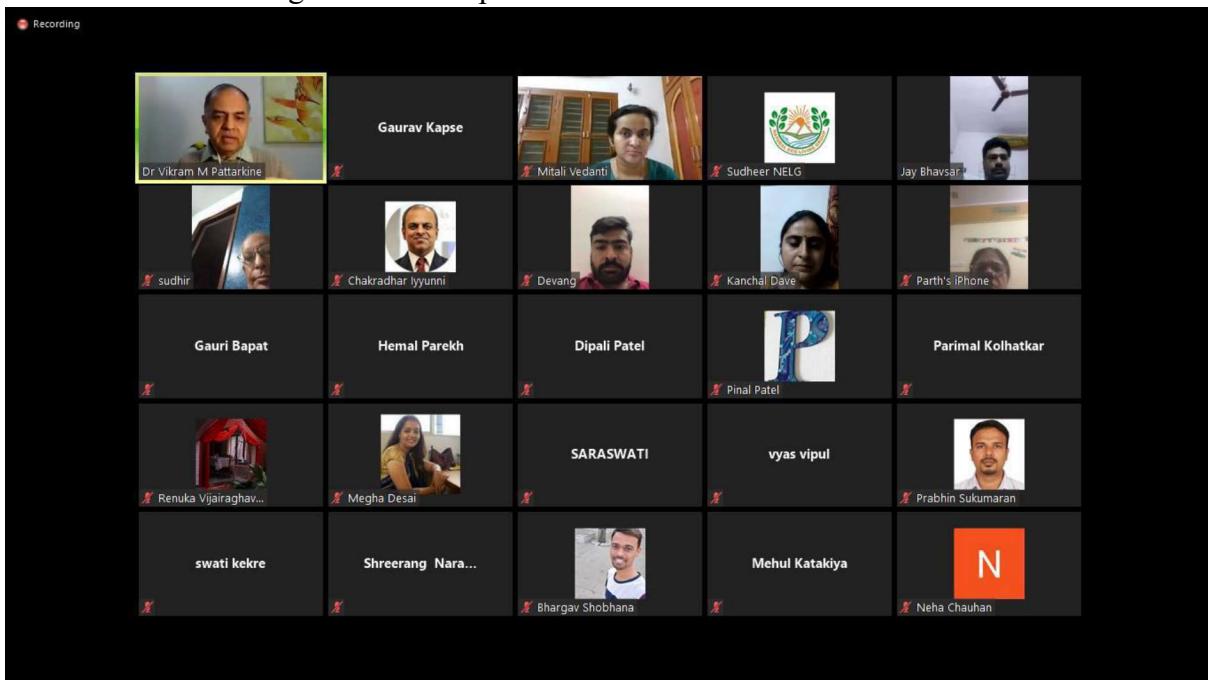


Fig 22: Webinar on Coronavirus Pandemic and Global Environment, What Can We Learn?



**Charotar Crocodile Count Summer 2018**

**Voluntary Nature Conservancy**  
101/Radha Darshan, Behind Union Bank, Velash Yashmeagar  
Gujarat  
WWW.VNCONINDIA.ORG

## HUMAN CROCODILE CONFLICTS

4 PM, SATURDAY, MAY 12, 2018

AUDITORIUM, NURSING BUILDING, CHARUSAT CAMPUS, CHANNA

**Professor Dr BC Choudhury**

On the occasion of Charotar Crocodile Count, Summer 2018, Join the eminent scientist Dr. B C Choudhury.



As he will introduce you the much talked about issue of human-crocodile conflict across India and internationally, reveal the possible causes of this conflict and shed light on the mitigation methods available.

Retired Scientist, Wildlife Institute of India  
Executive Trustee, Wildlife Trust of India  
Regional Vice Chair, IUCN SSC Marine Turtle Specialist Group  
Regional Vice Chair, IUCN-SSC Crocodile Specialist Group (S. Asia & Iran)  
Member, IUCN-SSC Cetacean Specialist Group  
Member, IUCN-SSC Freshwater Turtle and Tortoise Group  
Member, IUCN-SSC Conservation Breeding Specialist Group.  
Recipient, Distinguished Service Award 2005, Society for Conservation Biology

For more Information, please contact  
Voluntary Nature Conservancy (091)9898142170  
info@vnconindia.org


Fig 23: Lecture on Human Crocodile Conflicts

### M. S. Patel Department of Civil Engineering

Chandubhai S. Patel Institute of Technology  
Charotar University of Science and Technology, Changa

#### Endowment Chair Activity

26<sup>th</sup> to 30<sup>th</sup> December, 2017

#### WELCOMES



**Dr. Deepak Mishra**

Associate Professor, University of Georgia, USA  
Ph. D (Natural Resources), University of Nebraska, Lincoln (USA)  
M. Tech (Civil Engineering), Indian Institute of Technology, Kanpur  
(An International Expert on Climate Change & Remote Sensing)

#### Event Details (Open to All)



26th December,2017 10.30 to 12.30	Solving Environmental Challenges in the Age of Big Data: Role of Remote Sensing in Cyber-Physical Systems (CPS) Research
27th December,2017 10.10 to 12.10	The Future Climate of the Southeast, US: Research Opportunities
27th December,2017 02.20 to 04.20	Remote Sensing Tools for Civil Engineers
28th December,2017 12.10 to 02.10	One Day Workshop on "Climate Change & Environmental Benefits from Space Observations"
29th December,2017 12.10 to 02.10	Space Talk : University of Georgia's Small Satellite Research Lab: Upcoming Missions – SPOC and MOCI

Fig 24: Lecture Series on Environment and Climate Change

### E) Environmental Audit Cell

CHARUSAT has been recognized as a Schedule –I Environmental Auditor by Gujarat Pollution Control Board from Sept. 2017. Since 2017, CHARUSAT has handled the Environment Audit of more than 32 big and medium industries across the Gujarat.

### F) Technology and Knowledge Sharing through MoU's:

CHARUSAT entered into an MOU with Center for Environment Education (CEE), Ahmedabad. The Centre for Environment Education (CEE) in India was established in August 1984 as a Centre of Excellence supported by the Ministry of Environment and Forests. The organization works towards developing programmes and materials to increase awareness about the environment and sustainable development. The center is currently headed by Shri Kartikeya Vikram Sarabhai one of the world's leading environmental educators and a dedicated community builder.



રવિવાર, તા. ૨૧-૪-૨૦૧૯

ગત્યા પદકાર

## સાતત્યપૂર્ણ વિકાસ માટે ચારુસેટ યુનિ.માં Sandesh 21-04-2019 હેન્ડપ્રિન્ટ એક્ષન લેબની સ્થાપના

આંદોલન, તા. ૨૦  
યુનાઇટેડ નેશન્સ  
(યુનાઇટેડ સાતત્યપૂર્ણ  
વિકાસના દેતુ માટે ચારુસેટ  
ખુલ્લાંદરીની હેન્ડપ્રિન્ટ એક્ષન  
બેન્ફાન સ્થાપના કરવામાં  
આવી છે.)

આ બેળ યુનાઇટેડ  
નેશન્સને ડેવલપમેન્ટ ઓફ  
(SDG)ને વિદ્યાર્થીઓના  
પાયાના શિક્ષણમાં આવરી  
વહીને આસ્તિત્વ સેસન્સ તથા  
કિલ્ડર્સ દ્વારા ચાર્ચ સેસન્સ  
નાના અભ્યાસિકરણ ચુંચીના  
નમામ પાયાને આવરી બેસ.  
ચારુસેટમાં આ બેલ નાયાના  
માટે ચારુસેટ યુનિવર્સિટી અને  
સેન્ટર કાર્ડ અન્યાન્યમેન્ટ  
એન્સ્યુલ્યુનિયન (CEE) વચ્ચે  
અમદાવાદમાં કરસ કરવામાં  
આવ્યું હતુ. આ કરસ પર  
સેન્ટરની દરમિયાન અનુકૂળના  
પ્રસૂત સુરેન્દ્રાઈ પટેલ,  
CEEના રીટેક્ટર કર્નિંગ



દ્વારા હેન્ડપ્રિન્ટ માટે નિર્મિત  
એન્જિનિયરિંગના ૧૧૩  
વિદ્યાર્થીઓને પ્રેરણ મેળવ્યો  
હતુ. દેખાવીની મુખાકાત  
દરમિયાન જમ સેવા કર્નિંગ  
દ્વારા દિલ્લી દ્વારા નિર્મિત  
અભ્યાસિકરણ OBC- ST- SC  
ની વચ્ચાની પ્રાપ્તાની  
પરંપરા દ્વારા સેસન્સમાં -  
વિદ્યાર્થી બેચિન રહ્યું છે.  
ગ્રામીં ચિયારીની સુવિધા  
નાના લોલાં તથા ભૂરણ  
જળ પાય કરી આથ સૌચાલી  
વામજનો અભ્યાસનું પાડ પણી  
મજૂરી તરીક કરું છે.

આ વિદ્યાર્થીઓની  
સરસ જાહેર ચારુસેટના કાર્ય  
કરે તો જાને આચુક વાળ  
મળાંને નિર્માણ કરે યાંકેટે  
નાગરીક તરીકે ચાર્ચ માટે  
અન્યાન્ય આવીને સંપર્ક માનવ  
સમય તથા કર્તૃત્વ નેચું  
પરીક્ષણની આગવહી મર્દોના  
પાડ શરીરપદાનો છે. આ વેણો

### ચારુસેટમાં એક્ષન લેબની સ્થાપના



વલ્લભવિદ્યાનગર : ચાંગા યુનાઇટેડ નેશન્સ યુભેનનેના સાતત્યપૂર્ણ  
વિકાસના હેતુ માટે ચારુસેટ યુનિવર્સિટીમાં હેન્ડપ્રિન્ટ એક્ષન લેબની  
સ્થાપના કરવામાં આવી હતી. આ બ યુનાઇટેડ નેશન્સ  
સ્થાપના આંદોલના પાયાના શિક્ષણમાં આવરી લઈને  
કલાસરૂમ સેશન્સ તથા કિલ્ડ વર્ક દ્વારા આચયસેત્રમાં તેના  
અમલીકરણ ચુંચીના તમામ પાસાને આવરી બેશે. કાર્નિંગ સારાભાઈ,  
ચારુસેટ પ્રમુખ સુરેન્દ્ર પટેલ, રજીસ્ટ્રેઝર ડૉ. ટેવાંગ જોધી, માધ્યમી  
ઝોધી, પ્રી. ડૉ. એ.રી.પટેલ, ડૉ. વિજય પંચાલ, ડૉ. હિતેશી શાસ્ત્રી  
દ્વારા હતા.

Fig 25: CHARUSAT in News- SDG Handprint Lab

### G) Community Initiatives:

- Students were encouraged to work with the local communities of the adopted villages by CHARUSAT's CREDP in areas like solid waste management, reduction of plastics use, and conversion of plastic waste as well as paper waste to more valuable products
- There were also studies of environmental health problems in the local communities and steps needed to mitigate these problems. A closely related area is "Environmental Service-Learning" whereby student interns could learn about environmental problems while studying the environment of local communities.



## ANNEXURE-XI

### CARBON ACCOUNTING

#### 1) CARBON EMISSION

The estimate the GHG emissions of the CHARUSAT campus for the academic year 2018-2019 is divided into three major scopes:

Scope 1	Scope 2	Scope 3
<ul style="list-style-type: none"><li><b>Direct Emission</b> (Emissions from facilities within its organizational boundaries)</li></ul>	<ul style="list-style-type: none"><li><b>Indirect emissions</b> (Emissions from the imported electricity consumed by the organization)</li></ul>	<ul style="list-style-type: none"><li><b>Other indirect emissions</b> (Emissions from commuting and travel, waste generated by the organization)</li></ul>

#### Scope 1: Direct Emission

Direct Emission caused by:

- Burning of fossil fuel in electric generator sets
- Campus fleet (cars, tractors, ambulance, etc.)

#### Scope 2: Indirect Emission

Indirect Emission caused by:

- Indirect energy emissions of imported electricity from state electricity board

#### Scope 3: Indirect Emission

Indirect Emission caused by:

- Commuting by faculty, staff, and (i.e. commuting of students between home and university)
- Papers used within institute for answers sheets, questions papers, notices, circulars, teaching notes, lab manuals, curriculum booklets, and many more material used in both printed and unprinted form;
- Various wastes generated within the campus including organic, metal, glass, paper, and plastics



## Scope 1: Direct Emission

Direct Emission caused by:

### A. Burning of fossil fuel in electric generator sets

Diesel Used in Year 2018-19: 3000 L

$$\begin{aligned} \text{CO}_2 \text{ Emission} &= \text{Diesel Used} * \text{Emission Factor} = 3000 * 2.86 \text{ Kg CO}_2 / \text{L} \\ &= 8580 \text{ Kg CO}_2 = 8.58 \text{ Tons / Year} \end{aligned}$$

### B. Campus fleet (cars, tractors, ambulance, etc.)

Diesel Used in Year 2018-19: 38319 L

Petrol Used in Year 2018-19: 4829 L

Emission Factor: Diesel: 2.86 Kg CO<sub>2</sub>/ L, Petrol: \* 2.86 Kg CO<sub>2</sub>/ L (IPCC 2006)

$$\begin{aligned} \text{CO}_2 \text{ Emission} &= (\text{Diesel Used} * \text{Emission Factor}) + (\text{Petrol Used} * \text{Emission Factor}) = \\ &= 38319 * 2.86 \text{ Kg CO}_2 / \text{L} + 4829 * 2.43 / \text{L} \\ &= 109592.34 + 11734.47 \text{ Kg CO}_2 \\ &= 121.32 \text{ Tons / Year} \end{aligned}$$

## Scope 2: Indirect Emission

Indirect Emission caused by:

### A. Indirect energy emissions of imported electricity from state electricity board

Electricity Used in Year 2019: 14393106 KWH

$$\text{CO}_2 \text{ Emission} = 14393106 * \text{Emission Factor} = 14393106 \text{ KWH} * 0.82 \text{ Kg/KWH}$$

(Source: International Energy Agency (2009: 47–57)

$$= 12234140.1 \text{ kg} = 11802.35 \text{ Tons / Year}$$



### Scope 3: Indirect Emission

Indirect Emission caused by:

#### A. Commuting by faculty, staff, and (i.e. commuting of students between home and university)

Emission Factor	Bus	Omni buses	Two wheelers	Light motor vehicles (Passenger)	Cars and jeeps	Taxi	Trucks and lorries	Light motor vehicles (Goods)	Trailers and tractors	Others	M
CO <sub>2</sub>	515.2	515.2	26.6	60.3	223.6	208.3	515.2	515.2	515.2	343.87	S

CO<sub>2</sub> Emission in g/km Source: Mittal and Sharma, 2003

For Staff Commuters:

Number of Staff: 590 Number of Working Days: 291

Approx. Distance Traveled =  $30 * 590 * 291 = 5150700$  km

% Staff Members Travelling by Own Cars	35 %
% Staff Members Travelling by Car Pooling	48%
% Staff Members Travelling by Bus/ Public Vehicle	10%
% Staff Members Travelling by Motorcycle/ Bike/ Scooter	8%
Average Distance Travelled by Staff Members	30 KM

Based on the survey conducted of CHARUSAT Employees

CO<sub>2</sub> Emission by Car Travel:  $5150700 * 0.35 * 223.6$  g/km

= 403.09 Tons/ Year (Source: Mittal and Sharma, 2003)

CO<sub>2</sub> Emission by Car Pooling:  $5150700 * 0.48 * 208.3$  g/km

= 514.98 Tons/ Year (Source: Mittal and Sharma, 2003)



CO<sub>2</sub> Emission by Bus Travel:  $5150700 * 0.10 * 515.2 \text{ g/km}$   
= 265.36 Tons/ Year (Source: Mittal and Sharma, 2003)

CO<sub>2</sub> Emission by Two wheeler:  $5150700 * 0.08 * 26.6 \text{ g/km}$   
= 10.96 Tons/ Year (Source: Mittal and Sharma, 2003)

Total CO<sub>2</sub> Emission from Staff Commuting: 1194.39 Tons/Year

*For Students Commuters:*

Considering 60% students commute daily.

Number of Student commuters:  $7299 * 0.60 = 4379$

Number of Working Days: 291

Average Distance Travelled by Student Commuter: 30 KM

Approx. Distance Traveled =  $30 * 4379 * 291 = 38232162 \text{ km}$

% Students commuters Travelling by Bus	60%
% Students commuters Travelling by Car Pooling	30%
% Students commuters Travelling by Two Wheeler	10%

CO<sub>2</sub> Emission by Car Pooling:  $38232162 \text{ km} * 0.30 * 208.3 \text{ g/km}$   
= 2389.12 Tons/ Year (Source: Mittal and Sharma, 2003)

CO<sub>2</sub> Emission by Bus Travel:  $38232162 \text{ km} * 0.60 * 515.2 \text{ g/km}$   
= 11818.3 Tons/ Year (Source: Mittal and Sharma, 2003)

CO<sub>2</sub> Emission by Two wheeler:  $38232162 \text{ km} * 0.10 * 26.6 \text{ g/km}$   
= 101.69 Tons/ Year (Source: Mittal and Sharma, 2003)

Total CO<sub>2</sub> Emission from Student Commuting: 14309.11Tons/Year

**CO<sub>2</sub> Emission from Transportation: 1194.39 + 14309.11= 15503.50 Tons/Year**



**B. Papers used within institute for answers sheets and blank paper usage (questions papers, notices, circulars, teaching notes, lab manuals, curriculum booklets, and many more material used)**

*Answer Sheets*

(Papers) used per year: 583920 Nos = Around 2.6 Ton of Papers

500 Papers sheets of A4 size produces 2.26 Kg of CO<sub>2</sub>

**CO<sub>2</sub> Emission = (5839200/ 500) \* 2.26 = 26.39 Tons / Year**

*Other Papers*

Number of Paper rim used in AY 2018-19: 1396

Number of Pages in one rim: 500

Considering 100,000 sheets of paper from new sources requires over 8 trees and almost 2,000kWh of energy and carbon footprint of 6,000kg. (Source: [www.goodenergy.co.uk](http://www.goodenergy.co.uk))

1000 kg copying paper manufacturing emits 647.89 kg CO<sub>2</sub>

Total Number of A4 size papers used: 500 \* 1396 = 698000

**CO<sub>2</sub> Emission = (698000/100000) \* 6000 = 41.88 Tons Per Year**

**CO<sub>2</sub> Emission from Paper Usage = 41.88 + 26.39 = 68.27 Tons / Year**

**C. Various wastes generated within the campus including organic, metal, glass, paper, and plastics**

*CO<sub>2</sub> Emission from Waste to Landfilling: For Year 2018-19:*

Considering total waste amount per year is 87300 kg sent for land filling

Considering Emission Factor as 0.421 kg CO<sub>2</sub>e/kg (Source Huella Chile, MMA 2017)

**CO<sub>2</sub> Emission: 87300 \* 0.421 = 36.75 Tons of CO<sub>2</sub>**



*CO<sub>2</sub> Emission from Waste to Incineration: For Year 2018-19:*

Considering total waste amount per year is 29100 kg sent for land filling

Considering Emission Factor as 0.7 kg CO<sub>2</sub>/kg (Source Huella Chile, MMA 2017)

**CO<sub>2</sub> Emission: 29100 \* 0.7 = 20.37 Tons of CO<sub>2</sub>**

**CO<sub>2</sub> Emission from Waste Management: 36.75 + 20.67 = 57.42 Tons per year**

## **2) CARBON SAVING:**

Various campus activities and facilities are resulting into saving in carbon emission which are calculated below:

**A. CO<sub>2</sub> Absorbed by Green Cover/ Trees @ CHARUSAT Campus**

**B. CO<sub>2</sub> Emission Saved from Digital Paperless Exam**

**C. CO<sub>2</sub> Emission Saved from Solar Power Plant**

**A. CO<sub>2</sub> Absorbed by Green Cover/ Trees @ CHARUSAT Campus**

*Trees*

Total Number of Well Grown Trees @ Campus: 38150

Considering coverage areas of tree canopy = 0.0003 ha

Tree Cover = 0.0003 \* 38150 = 11.445 ha = 28.28 Acre (114445.1 sq. m.)

Considering CO<sub>2</sub> Absorbed by trees = 569.07 tons/ha/year

**CO<sub>2</sub> Absorbed by trees = 569.07 \* 11.445 = 6513.00 Tons/ Year**

*Grassland*

Area of Grass Land = Total Land Acquisition - Total Built-up – Tree Cover in Sq. M.

$$= 485623 - 140936.53 - 114445.1$$

$$= 230241.37 \text{ Sq. M.} / 56.89 \text{ Acre} / 23.023 \text{ ha}$$



Considering CO<sub>2</sub> Absorbed by Grassland = 12 tons/ha/year

**CO<sub>2</sub> Absorbed by Grassland/ lawn = 12 \* 23.023 = 276.27 Tons/ Year**

**Amount of CO<sub>2</sub> Absorbed by Green Cover/ Trees = 6513 + 276.27 = 6789.27 Tons/ Year**

### B. CO<sub>2</sub> Emission Saved from Digital Paperless Exam

500 Papers sheets of A4 size produces 2.26 Kg of CO<sub>2</sub>

CO<sub>2</sub> Saved = (5839200/ 500) \* 2.26 = **26.39 Tons / Year**

### C. CO<sub>2</sub> Emission Saved from Solar Power Plant

Considering 600 KWH of Electricity is produced per month

Solar Electricity produced Per Year = 600\*12 = 7200 KWH

CO<sub>2</sub> Saved = 7200 KWH \* 0.85 Kg/KWH

= 6120 kg = **6.12 Tons / Year**

## CARBON ACCOUNTING

Carbon Emission in Tons/ Year				Carbon Saving in Tons/ Year		Net Carbon Emission in Tons/ Year		
Scope 1		Scope 2		Scope 3		Scope 1 -6691.9	Scope 2 4980.57	Scope 3 8807.41
DG Set	8.58	Electricity Import	11802.4	Transportation	15503.5	Green Cover	6789.27	
Campus Fleet	121.32			Paper Usage	68.27	Digital Paperless Exam	26.39	
Total	129.9			Waste Management	57.42	Solar Power Plant	6.12	
Total	129.9	Total	11802.35	Total	15629.19	Total	6821.78	

**CF total (In kilotons of CO<sub>2</sub> Eq.)** = Scope 1 + Scope 2 + Scope 3 – Carbon Savings

$$= 129.9 + 11802.35 + 15629.19 - 6821.78$$

$$= 20739.66 \text{ Tons/ Year} = **20.73 kilotons of CO}_2 \text{ Eq.}**$$

Total No. of Staff and Students = 590 + 7299 = 7889

**CF (in tons of CO<sub>2</sub> Eq.) = 20739.66 / 7889 = 2.62 Tons of CO<sub>2</sub> Per Person per Year**



### Comparative analysis of carbon footprint studies

A comparative analysis of studies from other universities of India and across the globe is tabulated below. Birla Institute of Technology, Pilani (BITS), De Montfort University (DeMU), University of Cape town (UCT), Norwegian University of Science and Technology (NTNU), Yale University and University of Illinois at Chicago (UIC) are compared for its Carbon Footprint with CHARUSAT.

Particulars	CHARUSAT, Changa	BITS Pilani (Kuldip et al. 2018)	DeMU (Ozawa et al. 2013)	NTNU (Larsen et al. 2013)	UCT (Letete et al. 2011)	Yale Uni. (Thurston et al. 2011)	UIC (Larsen et al. 2013)
CF total (In kilotons of CO <sub>2</sub> Eq.)	20.73	16.5	50.7	92	84.9	817	275
CF per Person (in tons of CO <sub>2</sub> Eq.)	2.62	4.65	1.13	4.6	3.6	53.54	10.94
Scope wise CO <sub>2</sub> emissions in %							
Scope 1	-32 %*	1.00 %	6.90 %	30.50 %	0.90 %	65.50 %	64.50 %
Scope 2	25 %	50.10 %	17.50 %	19.10 %	80.50 %	15.80 %	17.40 %
Scope 3	43 %	48.90 %	75.60 %	80.60 %	18.70 %	18.70 %	18.10 %

\* Carbon Negative based on Net Carbon Emission in Scope 1

**CHARUSAT, Changa has lesser per person Carbon Footprint than that of other Universities listed above and have Negative Carbon Footprints in Scope 1 of direct emissions.**



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# **ENVIRONMENTAL AUDIT REPORT**

of



## **CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY**

CHARUSAT Campus, Village: Changa,  
District: Anand-388421  
(April 2020 to March 2021)

Prepared By

**Environmental Engineering Laboratory  
(GPCB Recognised Schedule-I Environment Auditor)**

M. S. Patel Department of Civil Engineering,  
Chandubhai S. Patel Institute of Technology (CSPIT)

**Charotar University of Science & Technology, CHARUSAT**  
CHARUSAT Campus, Changa, Dist.: Anand, State: Gujarat. PIN Code - 388 421



## EXECUTIVE SUMMARY

This following observation provides a summary of the findings of an environmental audit of M/s. Charotar University of Science & Technology, Changa, Anand.

Particulars	Observations/ Findings
<b>Consent and Production</b>	
Name & Address of University	Charotar University of Science & Technology, CHARUSAT Campus, Changa, Dist.: Anand- 388421
Audit Period	2020-21
<b>Consumption of Energy, Fuel, Water, etc.</b>	
Total Power Consumption	760704 KWH
Water Consumption	458680 L/Day
<b>Pollution &amp; Control</b>	
Wastewater Generation	3,85,654 L/Day
Monitoring Facilities	Adequate
<b>General</b>	
In-house Facilities	Adequate
Green Belt/Cover	485623 Sq. Meter
<b>Suggestions by Auditors</b>	
1. Please refer Annexure-15 Environment Management Plan for Suggestion and its Priorities.	



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# **ENVIRONMENTAL AUDIT REPORT FOR Charotar University of Science & Technology**

Period From 1<sup>st</sup> April 2019 to 31<sup>th</sup> March 2020

<b>(A) GENERAL</b>		
1	Name of the Organisation:	Charotar University of Science & Technology
2	Location:	CHARUSAT Campus, Changa Ta- Petlad, Dist.- Anand-388421
3	Registered Office Address:	CHARUSAT Campus, Changa Ta- Petlad, Dist.- Anand-388421
4	Month & Year of establishment:	January 2000
5	No. of Employees:	Total Employees: 590
	Teaching staff	Total: 389
	Non- Teaching staff	Total: 281
6	No. of electrical connections with service numbers:	Type: H. T. – 11 KV Consumer No. : 15241
	Total connected load	Contract Demand Load : 550 KVA
	Electric consumption per unit of product manufactured:	Please refer Annexure-1



	Percentage Enhancement in Energy: Saving as Compared to Previous Year:	12% NA
7	Number of D.G. Set & their capacity:	Name of D.G Set
		1) Hostel-1 & 2
		2) Hostel-3 and MCA Building Auditorium.
		3) RPCP Building
		4) PDPIAS Building
		5) PDPIAS Auditorium
		6) PDPIAS VSM Lab
		7) Admin Building & EC/EE Building
		8) CE/IT Building & ME/Civil Building
		9) CE/IT Building Win Cell Department
8	Name/Residential address of all directors/partners:	Please refer Annexure-2
9	Telephone Nos:(Residential & Industrial) Fax No:	Tele: 02697-265011/21
	Web site of Institute:	Fax No: 0697-265007 <a href="http://www.charusat.ac.in">www.charusat.ac.in</a>
	E-mail of Institute :	info@charusat.ac.in
	E-mail Partners/Directors:	Please refer Annexure-2
10	No. of shifts & timings:	Flexi Timings with 7.5 Working Hours Per Day, 11 to 3 Core Working Hours
11	Working Day:	6 Day ( Monday to Saturday)



12	Has the institute obtained ISO 9000/ISO 14000/OSHAS 18000/Any other EM accreditation/Certification recognition? Give details.	Yes, Please refer Annexure-3
13	No. of Working days	Please refer Annexure – 4
<b>B</b>	<b>WATER</b>	
1	The quantity of water consumed per day :	458680 L/Day
2	The quantity of waste water.	3,85,654 L/Day
3	The quantity and quality of sewage and its method of treatment and disposal	It is discharged to soak pit for individual point. The quantity of sewage effluent is @ 100 lit /day Refer Annexure –5
4	The open area available for disposal of the effluent	Not applicable
5	Whether the quality of treated effluent meets the specified norms:-If no, the extent of deviation and reasons thereof	Yes
<b>C</b>	<b>AIR</b>	
1	No. of the flue gas stacks, their height (from ground level)nature & consumption of fuel:	Refer Annexure – 6
2	The quality of emission from each flue gas stack & the process stack & the extent of deviation from them:	Refer Annexure – 7 Well within Limits



3	The ambient air quality within the factory premises. Ambient air quality monitoring Stations outside the intuional.	Refer Annexure – 8 Well within Limits
4	The details of air pollution control measures for all process & flue gas stacks:	NA
5	Improvement in emission quality since previous environmental audit based on performance evaluation of air pollution management system	Air pollution Control System performing well & adequate.
<b>D</b>	<b>HAZARDOUS (SOLID) WASTE</b>	
1	The quantity, sources & composition of hazardous waste/solid waste from each process/sources over the last three years	Refer Annexure – 9
2	The method of storage, treatment & disposal of hazardous/solid waste:	Open Burning in a pit & Incineration
<b>E</b>	<b>BIOMEDICAL WASTE</b>	
1	The Waste is collected for further disposal by GPCB authorized agencies:	Refer Annexure – 10
<b>F</b>	<b>SITE PLAN</b>	
	The site plan showing the location of effluent treatment plant, final point of disposal of effluent, sampling point, drainage line, stacks, solid waste storage, disposal area & green belt (its width)	Refer Annexure – 11
<b>G</b>	<b>RESOURCE RECOVERY</b>	
1	The details regarding resource recovery including treated effluent for recycle/reuse from environmental pollution control system including	Yes



	effluent treatment plant:	
<b>H</b>	<b>HEALTH</b>	
1	Whether any hazard is involved in the manufacturing or from the work environment: Yes/No  If yes, provide details thereof:	No
2	Whether Institute has pre-employment & periodical medical examination facilities: Yes/No  If yes, provide details thereof:	Yes,  Pre-medical check-up is done for all employees and medical check-up of all employees is carried out periodically.
3	Whether health records are maintained regarding adverse effect on the health of workers: Yes/No  If yes, provide details thereof:	NA
4	Whether industry has appointed a factory medical officer: Yes/No  If yes; full time or part time. Include the details about the name, address and qualification of the factory medical officer	Yes  CHARUSAT Hospital
5	Details of medical facilities available. Dispensary/Ambulance/Hospitals/First Aid box.	First Aid Box – Yes  Small Dispensary – Yes  Ambulance – Yes  Hospital – Yes
6	Whether sanitary facilities like water closets, urinals, bathroom are provided & are satisfactory	Yes. Adequate & Satisfactory sanitary facilities are provided.



<b>I ACCIDENTS</b>			
1	The details of accidents in the Institute if any & remedial measures taken	No	
<b>J SAFETY MEASURES</b>			
1	General Environment of the factory	Housekeeping Dustiness Lighting Ventilation	Good Medium Good Good
3	The details of facilities for disaster management/gas leakage.	NA	
4	Whether on site/off site emergency plans are prepared and are being implemented/upgraded regularly; please give details	NA	
5	Whether records of occupational hazards are maintained?	NA	
6	Preventive measures adopted to minimize occupational hazard.	Yes	
<b>K REMEDIAL MEASURES</b>			
1	The details of sources; monitoring & measures taken for control of noise pollution in & around the Institute premises:	Refer Annexure – 12	
2	The measures taken for prevention treatment & control of odour nuisance in & around the Institute premises:	Yes, Green Belt	
3	Whether insurance policy obtained under PLI Act. Yes/No	Yes. Refer Annexure –13	



It is here declared that all the information submitted in with respect to this format is correct and we will be responsible for any lapse regarding incorrect or incomplete information.

Name and signature of all the members of audit team

Sr. No.	Name with Designation	Sign
1	<b>Mr. Gaurav Kapse</b> Environmental Engineer	
2	<b>Mr. Gaurav Patel</b> Chemical Engineer	
3	<b>Dr. Seema Amin</b> Microbiologist	
4	<b>Mr. Jinit R. Patel</b> Chemist	



## ANNEXURE-1

### DETAILS OF ELECTRICAL CONSUMPTION

Month	2020-21
April -2020	35418
May-2020	39169
June-2020	85569
July-2020	98314
August-2020	92504
September-2020	85084
October-2020	78071
November-2020	54420
December-2020	39394
January-2021	39425
February-2021	43425
March-2021	69911
<b>Total</b>	<b>760704</b>



## ANNEXURE – 2

### NAME & DESIGNATION OF BOARD MEMBERS

#### Councils, Boards, Committees at CHARUSAT

##### Governing Body

<b>Shri Surendra M Patel</b> President, CHARUSAT President, Shri Charotar Moti Sattavis Patidar Kelavani Mandal Former Chairman, Ahmedabad Urban Development Authority Former, Member of Parliament, Rajya Sabha    A Renowned Technocrat	<b>President</b>
<b>Dr. Pankaj Joshi</b> Provost, CHARUSAT	<b>Provost</b>
<b>Shri Virendra S Patel</b> Trustee, Shri Moti Sattavis Patidar Kelavani Mandal Treasurer, CHRF   Founder, Charusat Educational Foundation, USA	<b>Member</b>
<b>Dr. V G Patel**</b> Founding Director EDI   Renowned Expert in Entrepreneurship Development	<b>Member</b>
<b>Dr. M I Patel</b> Former Sheriff of Mumbai   Renowned Technocrat and Industrialist Chief Parton, Smt. Chandaben Mohanbhai Patel Computer Application, CHARUSAT	<b>Member</b>
<b>Shri Naginbhai M Patel</b> President, CHRF President, Shri Charotar Moti Sattavis Leuva Patidar Samaj – Mathrusansthा	<b>Member</b>
<b>Dr. Manan Raval</b> Dean, Faculty of Pharmacy   Principal, Ramanbhai Patel College of Pharmacy	<b>Member</b>
<b>Dr. Amit Ganatra</b> Dean, Faculty of Technology & Engineering Head, Department of Computer Engineering, CSPIT	<b>Member</b>
<b>Shri Hemal Patel</b> CEO, Elitecore Technologies Ltd NJ-USA and India Leading Entrepreneur in IT Industry	<b>Member</b>
<b>Dr. Bimal Patel</b> Director, Gujarat National Law University	<b>Member</b>
<b>Dr. Paresh Patel</b> Prominent Surgeon (FACS, FICS-USA) President & Surgeon, Shreedha Hospital, Vahera (Borsad) Leading Entrepreneur in IT Industry	<b>Member</b>
<b>Shri Devang Patel</b> Chief Executive, IPCO Industries & Business operated at USA Chief Parton, Indukaka Ipcowala Institute of Management   A Philanthrope of repute	<b>Member</b>
<b>Shri Pankaj R Patel</b> Chairman & Managing Director, Cadila Healthcare Ltd Chief Patron, Ramanbhai Patel College of Pharmacy Chairman, Ahmedabad Management Association	<b>Member</b>
<b>Principal Secretary</b> Department of Education, Government of Gujarat	<b>Member</b>
<b>Shri Mahesh G Patel *</b> Coordinator, Education Campus Anand	<b>Invitee Member</b>
<b>Mr. Devang Joshi (Ex – officio)</b> Registrar, CHARUSAT	<b>Ex - officio</b>



## ANNEXURE – 3

### ACCREDITATION CERTIFICATES



The Executive Committee of the **Knowledge Consortium of Gujarat, Department of Education, Government of Gujarat** on the recommendation of the duly appointed agency, the Indian Centre for Academic Rankings and Excellence (**ICARE**) has rated

*Chandubhai S Patel Institute Of Technology*



as a **3 Star** Institution with a CGPA of **2.48 out of 5** in the category of '**ENGINEERING**' on the basis of comprehensive performance metrics as set out in the **Gujarat State Institutional Ratings Framework (GSIRF)** on the 28th February 2019.

PARAMETER	STAR RATINGS
TEACHING, LEARNING & RESOURCES	★★★★★
RESEARCH AND PROFESSIONAL PRACTICE	★★★
GRADUATION OUTCOMES	★★★★★
OUTREACH AND INCLUSIVITY	★★★★★

#### BY ORDER

Anju Sharma IAS  
Principal Secretary  
Education  
Government of Gujarat

KB Upadhyay IAS (Retd.)  
CEO  
Knowledge Consortium of Gujarat  
Government of Gujarat

Dr Karthick Sridhar  
Vice Chairman  
ICARE

Syed Mujahid  
Director - Ratings  
ICARE

VALID UPTO 30TH MARCH 2020



## KNOWLEDGE CONSORTIUM OF GUJARAT

આ નો ભરા. કાર્યક્રમ યન્ત્ર વિષયત:

Department of Education, Government of Gujarat

### Certification of Accreditation

*Knowledge Consortium of Gujarat*

*On the recommendation of the duly appointed*

*Peer Team is pleased to declare the*

***Charotar University Of Science And Technology,  
Changa***

*As Accredited*

*With CGPA 3.06 on four point scale*

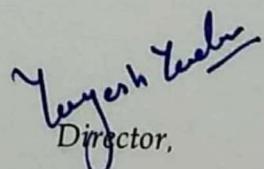
*As per NAAC criteria*

*At Grade A*

*Valid up to December 13, 2017*

*December 14, 2015*



  
Director,

(Quality Assurance), KCG

---

Opp.P.R.L., B/h. L.D. Engineering College, Navrangpura, Ahmedabad,Gujarat, India  
Phone number: - 079-26302067, 77 | Email id: [directorqa.kcg@gmail.com](mailto:directorqa.kcg@gmail.com) |



## **ANNEXURE – 4**

### **DETAILS OF WORKING DAYS**

<b>Month</b>	<b>Working Days</b>
<b>April -2020</b>	03
<b>May-2020</b>	25
<b>June-2020</b>	25
<b>July-2020</b>	26
<b>August-2020</b>	20
<b>September-2020</b>	25
<b>October-2020</b>	25
<b>November-2020</b>	20
<b>December-2020</b>	25
<b>January-2021</b>	22
<b>February-2021</b>	23
<b>March-2021</b>	25
<b>Total</b>	<b>264</b>



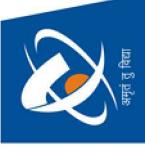
## ANNEXURE – 5

### DETAILS OF QUALITY OF WATER

Date of Collection: 16.09.2020

Mode of Collection: Grab

Sample Description	Sample ID	pH	Temp	TDS	EC	Chlorides (mg/L)
Centre Square Left Side-1 RO Water(A-6 Building)	CH/W/20/1	7.08	25.6	27.4	55.9	8.9752
Boys Washroom Tap Water RHS(A-6 Building)	CH/W/20/2	7.26	26.1	375	0.8	52.0136
Ro Water Tap-2 Nr Boys Washroom RHS(A-6 Building)	CH/W/20/3	7.05	24.1	25.4	59.7	5.9063
Centre Square RO Water, RHS-1 G.Floor(A-6 Building)	CH/W/20/4	6.8	25.5	29.1	62.5	5.0377
Centre Square Ro Water LHS-1, G.Floor(A-6 Building)	CH/W/20/5	6.4	25.7	25.7	61.1	7.0064
Boys Washroom Tap Water(A-6 Building)	CH/W/20/6	7.15	25.5	BLQ	0.06	48.0048
Centre Square Ro Water LHS-2,G.Floor(A-6 Building)	CH/W/20/7	6.95	26	25.21	66.5	3.9888
Centre Square Ro Water RHS-3, G.Floor(A-6 Building)	CH/W/20/8	6.52	25.1	25.8	72	BLQ
RO Water RHS, 1 <sup>st</sup> Floor(A-6 Building)	CH/W/20/9	7.02	24	25.3	54.8	10.0023
Smithy shop RO Water, Nr Mech. Workshop(A-6 Building)	CH/W/20/10	7.25	25.1	BLQ	0.08	47.9296
RO Water, Nr Workshop(A-6 Building)	CH/W/20/11	7.16	25.5	26.9	38.74	7.0034
Boys Washroom RHS(A-6 Building)	CH/W/20/12	7.25	24.9	0	0.06	46.6528
G.Floor Tap Water, Nr. Staff Room(A-2 Building)	CH/W/20/13	7.45	26.4	460	1035	44.987
Ro Water, Nr. Girls Washroom G.Floor(A-2 Building)	CH/W/20/14	7.10	25.5	59.9	141.8	15.0025
Staff Room, 1 <sup>st</sup> Floor Ro Water(A-2 Building)	CH/W/20/15	7.35	25.4	42.4	0.01	51.0108
Nr. Boys Washroom Ro Water RHS-1 G.Floor(A-2 Building)	CH/W/20/16	7.48	23.9	41.4	86.6	14.9816
Ro Water Nr. Girls Washroom 1 <sup>st</sup> Floor(A-2 Building)	CH/W/20/17	7.20	25.9	72.5	142.7	3.0058
RO Water nr.Girls Washroom, 1 <sup>st</sup> Floor(A-2 Building)	CH/W/20/18	7.12	25.9	65	148.8	13.4596



Garden Water G.Floor(A-2 Building)	CH/W/20/19	7.25	25.5	340	0.05	43.385
Girls Washroom Tap Water 1 <sup>st</sup> Floor(A-2 Building)	CH/W/20/20	7.62	26.4	460	1035	42.380
Lab-313 Tap Water(A-8 Building)	CH/W/20/21	7.58	26.8	468	0.10	50.9285
Nr.Lab No.313 RO Water(A-8 Building)	CH/W/20/22	6.72	27.1	12.8	21.6	BLQ
Room No-218 RO Water(A-8 Building)	CH/W/20/23	7.01	24.2	27.6	15.20	3.1099
Girls Washroom RO Water, G.Floor(A-2 Building)	CH/W/20/24	7.06	25.5	72.3	150.6	44.289
Girls Washroom Tap Water, G.Floor(A-8 Building)	CH/W/20/25	7.42	25.2	484	25	3.0385
Room No.125 RO Water, G.Floor(A-8 Building)	CH/W/20/26	6.25	27.3	9.94	23.8	44.289
Lab No.125 Tap Water, G.Floor(A-8 Building)	CH/W/20/27	7.18	26.4	BLQ	0.06	12.6024
Room No.119 RO Water, G.Floor(A-8 Building)	CH/W/20/28	7.12	24.6	12.92	28.6	6.8064
Room No.117 RO Water, G.Floor(A-3 Building)	CH/W/20/29	6.9	25	14.8	34.6	1.9675
Gardening Point(A-2 Building)	CH/W/20/30	7.6	24	53.5	1145	51.0025
Nr. Boys Washroom RO Water(A-9 Building)	CH/W/20/31	7.25	25	45	128	8.8842
Washroom Tap Water, G.Floor (A9 Building)	CH/W/20/32	7.6	26.3	43.5	936	38.0086
Boys Washroom Tap Water,G.Floor (A-3 Building)	CH/W/20/33	7.8	25.4	67.8	145.6	53.0912
Tap Water, G.Floor (H-1 Building)	CH/W/20/34	7.56	27	482	1035	67.984
Garden Tap Water(A-9 Building)	CH/W/20/35	7.51	26.5	43.6	945	42.2032
RO Water, G.Floor(H-2 Building)	CH/W/20/36	7.01	27	36.9	78	7.1254
Nr.Boys Washroom, RO Water, G.Floor(A-9 Building)	CH/W/20/37	7.20	27	25.8	45.8	17.1541
Nr. Girls Washroom RO Water 1 <sup>st</sup> Floor(A-7 Building)	CH/W/20/38	7.35	25.8	78.2	160.8	7.0084
Girls Washroom Tap Water, G.Floor(A-7 Building)	CH/W/20/39	7.2	26.4	512	1102	47.105
Girls Washroom RO Water, G.Floor(A-9 Building)	CH/W/20/40	7.06	25.8	35.68	78.9	7.0084
Nr. Boys Washroom RO Water,G.Floor(A-5 Building)	CH/W/20/41	7.72	26.2	29.5	12.5	20.986
Boys Rest Room, Tap Water,1 <sup>st</sup> Floor(A-7 Building)	CH/W/20/42	7.6	2.36	456	969	52.9256
Nr. Boys Washroom, RO Water, 1 <sup>st</sup> Floor(A-9 Building)	CH/W/20/43	7.15	24.8	24.7	558.8	7.5468
Boys Rest Room, Tap Water, 1 <sup>st</sup> Floor(A-5 Building)	CH/W/20/44	7.62	26.2	486	1020	50.6532
Boys Rest Room, Tap Water, G.Floor(A-5 Building)	CH/W/20/45	7.58	25.8	495	112	50.5684
Nr. Girls Washroom, RO Water, 1 <sup>st</sup> Floor(A-9 Building)	CH/W/20/46	6.58	23.8	36.5	68.7	8.6984



RO Water 1 <sup>st</sup> Floor(A-9 Building)	CH/W/20/47	6.89	22.4	36.5	74.8	12.304
F.M Lab(A-7 Building)	CH/W/20/48	8.45	25.4	632	1330	60.2185
Nr. Boys Washroom, RO Water,1 <sup>st</sup> Floor(A-7 Building)	CH/W/20/49	7.35	24.6	76.2	165.2	10.0056
Nr.Room No-414, RO Water(A-5 Building)	CH/W/20/50	7.4	25.6	215	485	19.3203
Nr. Boys Washroom, RO Water, G.Floor(A-7 Building)	CH/W/20/51	7.52	24.8	72.3	155.8	8.9862
Nr. Girls Washroom, RO Water,1 <sup>st</sup> Floor(A-9 Building)	CH/W/20/52	7.08	24.6	40.5	82.5	7.0089
Nr Girls Rest Room, RO Water, 1 <sup>st</sup> Floor(A-9 Building)	CH/W/20/53	7.18	22.2	35	72.5	10.1652
Boys Washroom, Tap Water, G.Floor(A-7 Building)	CH/W/20/54	7.52	26.5	535	1112	43.984
Boys Washroom, RO Water, G.Floor(A-7 Building)	CH/W/20/55	7.22	24.5	71.9	167.8	20.1403
Nr. Boys Washroom, Tap Water, G.Floor(A-9 Building)	CH/W/20/56	7.56	26.2	24.3	62.5	BLQ
Boys Washroom, RO Water, 2 <sup>nd</sup> Floor(A-7 Building)	CH/W/20/57	7.38	24.9	82.2	161.1	10.10243
Boys Washroom, Tap Water, 2 <sup>nd</sup> Floor(A-7 Building)	CH/W/20/58	7.55	26.2	525	1116	42.7524
Boys Washroom, Tap Water, 2 <sup>nd</sup> Floor(A-5 Building)	CH/W/20/59	7.38	27.5	486	1058	21.965
Boys Restroom, Tap Water, 2 <sup>nd</sup> Floor(A-5 Building)	CH/W/20/60	7.48	25.4	495	1075	46.6632
Boys Washroom, Tap Water,1 <sup>st</sup> Floor(A-3 Building)	CH/W/20/61	7.15	25.3	575	1210	67.5813
Room No.219,RO Water, 1 <sup>st</sup> Floor(A-3 Building)	CH/W/20/62	6.85	24.5	15.32	29.8	10.0521
Room No.471, RO Water,2 <sup>nd</sup> Floor(A-5 Building)	CH/W/20/63	7.48	26.3	236	502	16.0526
Room No.219,RO Water,1 <sup>st</sup> Floor(A-3 Building)	CH/W/20/64	6.30	27.2	13.8	29.8	3.0582
Room No.219,RO Water,1 <sup>st</sup> Floor(A-3 Building)	CH/W/20/65	6.20	25.8	14.2	29.5	3.3655
Room No.111,RO Water(H-5 Building)	CH/W/20/66	6.35	27.9	26.5	61.6	14.8569
Room No.212,RO Water(H-5 Building)	CH/W/20/67	6.42	26.8	27.8	61.6	5.6386
Room No.112,RO Water(H-5 Building)	CH/W/20/68	6.86	24.5	13.9	32.8	3.0864
Room No.109,Tap Water, G.Floor(A-3 Building)	CH/W/20/69	7.32	25.3	558	1195	69.564
Boys Washroom, RO Water,1 <sup>st</sup> Floor(A-3 Building)	CH/W/20/70	7.26	26.5	555	1201	58.2168
Lab-106,Tap Water, G.Floor(A-3 Building)	CH/W/20/71	7.22	27.5	568	1200	72.2549
Room No.117, RO Water, G.Floor(A-3 Building)	CH/W/20/72	6.75	24.8	15.2	35	70.9563
Room No.103, Tap Water, G.Floor(A-3 Building)	CH/W/20/73	7.25	26.9	563	1215	75.8264



Room No.213, RO Water, 1 <sup>st</sup> Floor(H-5 Building)	CH/W/20/74	6.30	25.6	24.6	65	10.0425
Nr. Boys Washroom, RO Water, 1 <sup>st</sup> Floor(H-5 Building)	CH/W/20/75	6.8	25.4	30.2	60.3	7.5621
Boys Washroom, RO Water, 1 <sup>st</sup> Floor(H-5 Building)	CH/W/20/76	6.7	27	29.3	62.5	12.124
RO Water, RHS, 1 <sup>st</sup> Floor(A-5 Building)	CH/W/20/77	7.36	24.5	27.2	65	10.256
Between Room No.2-3 Tap Water, G.Floor(R-4 Building)	CH/W/20/78	7.45	25.8	41.5	910	40.0128
Tap Water,1 <sup>st</sup> Floor(R-4 Building)	CH/W/20/79	7.15	25.6	41.8	956	32.115
Between Room No.2-3 RO Water(R-4 Building)	CH/W/20/80	6.8	24.8	22.4	68	10.1257
Nr. Room No.28, Tap Water, 1 <sup>st</sup> Floor(R-4 Building)	CH/W/20/81	7.5	25.2	42.5	925	28.0058
Between Room No.15-16 RO Water, G.Floor(R-3 Building)	CH/W/20/82	7.01	25.8	32.6	72.5	20.1003
Between Room No.15-16,Tap Water, G.Floor(R-3 Building)	CH/W/20/83	7.3	26.3	43.5	925	37.4589
Nr. Room No.102,RO Water, G.Floor(H-6 Building)	CH/W/20/84	6.8	25.3	28.6	65.5	10.0542
Between Room No.27-28,Tap Water(R-3 Building)	CH/W/20/85	7.6	28.5	43.6	1015	39.9854
Between Room No.15-16,Tap Water, G.Floor(R-3 Building)	CH/W/20/86	7.2	30.2	44.5	985	37.9659
Boys Washroom, RO Water(H-5 Building)	CH/W/20/87	6.8	25.6	28.5	65.3	10.256
Nr. Room No.102, RO Water(H-6 Building)	CH/W/20/88	6.8	22.8	32.2	45.3	11.5237
Room No.110, RO Water(H-6 Building)	CH/W/20/89	7.01	24.5	68.8	168.5	19.2403
Room No.110,RO Water(H-6 Building)	CH/W/20/90	7.5	27.2	82.5	172.6	20.2417
Room No.102, RO Water(H-6 Building)	CH/W/20/91	6.8	23.5	52	95.4	12.4466
Boys Washroom, RO Water,1 <sup>st</sup> (A-7 Building)	CH/W/20/92	7.36	23.6	84.5	172.3	8.0956
Nr. Room No.316, Tap Water(A-5 Building)	CH/W/20/93	7.65	26	486	1025	45.2246
Nr. Room No.27, RO Water,1 <sup>st</sup> Floor, (R-4 Building)	CH/W/20/94	6.82	25.4	30.2	65.8	10.0256
Nr. Room No. 23-24, Tap Water, G.Floor(R-4 Building)	CH/W/20/95	7.52	25.8	429	956	44.2245
Nr. Room No. 23-24, Tap Water, G.Floor(R-4 Building)	CH/W/20/96	7.32	25.3	43.5	950	40.0128
Nr. Room No. 23-24, Tap Water, G.Floor(A-5 Building)	CH/W/20/97	7.75	25.4	256	564	25.6245
Tap Water(A-1 Building)	CH/W/20/98	7.5	27.5	480	1023	45.9869
RO Water(A-1 Building)	CH/W/20/99	6.05	30.2	38.9	95.6	10.0256



RO Water(A-1 Building)	CH/W/20/100	6.68	22.3	70.5	142.3	7.7054
Tap Water(A-1 Building)	CH/W/20/101	7.42	27.6	52.4	120.5	58.86
RO Water(F-1 Building)	CH/W/20/102	7.3	26.5	28.6	62.3	50.4632
RO Water(F-2 Building)	CH/W/20/103	6.8	23.9	56.7	132.5	8.0856
Tap Water(F-2 Building)	CH/W/20/104	8.2	25.3	570	1186	55.23
RO Water(F-2 Building)	CH/W/20/105	7.15	25.6	128.5	286	55.45
RO Water(F-1 Building)	CH/W/20/106	7.64	26.5	654	2.6	75.3658
Tap Water (Nr. Iceberg)	CH/W/20/107	7.62	27.2	485	1002	10.0862
Ro Water,1 <sup>st</sup> Floor(A-7 Building)	CH/W/20/108	6.8	24.2	65.3	128.5	50.0135
Tap Water, Mech.Garden(A-7 Building)	CH/W/20/109	7.42	25.2	54.5	1086	44.9684
Backyard, Tap Water(A-3 Building)	CH/W/20/110	7.45	28.3	485	1020	50.1935
RO Water,1 <sup>st</sup> Floor(A-3 Building)	CH/W/20/111	6.2	25.2	15.4	45.6	8.9856
Smithy Shop, Tap Water(A-6 Building)	CH/W/20/112	7.4	27.2	558	1155	75.8546
I.T Boys Washroom, RO Water(A-7 Building)	CH/W/20/113	6.8	22.5	62.5	112.5	12.458
I.T Girls Washroom, RO Water(A-7 Building)	CH/W/20/114	6.75	26.5	61.2	112.6	7.0032
Nr. Boys Washroom, Tap Water(A-9 Building)	CH/W/20/115	7.6	27.5	485	1015	5.2569
RO Water(H-1 Building)	CH/W/20/116	6.2	24.8	16.95	45	72.9631
Between Room No.28-29, RO Water,1 <sup>st</sup> Floor(R-3 Building)	CH/W/20/117	6.5	24.6	32.5	65.3	7.5863
Between Room No.2-3, RO Water, G.Floor(R-3 Building)	CH/W/20/118	6.01	23.6	26.4	62	5.6328
Between Room No.52-53, RO Water,3 <sup>rd</sup> Floor(H-1 Building)	CH/W/20/119	6.51	22.5	32.1	60.2	10.0658
RO Water(H-2 Building)	CH/W/20/120	7.01	26.5	78.5	170.3	7.7035
Nr. Women's Health & PT, RO Water(H-5 Building)	CH/W/20/121	6.65	26.5	30.5	75	7.7035
Child Lab, RO Water(H-6 Building)	CH/W/20/122	7.25	23.6	45.8	86	54.9813
Nr. HOD Office, Tap Water(A-7 Building)	CH/W/20/123	7.32	26.9	502	1048	48.6832
Nr. KDCC Bank, RO Water(Charusat Campus)	CH/W/20/124	6.35	25.8	15.82	35	BLQ
Nr. Nescafe, Tap Water(Charusat Campus)	CH/W/20/125	7.65	28.5	506	1025	55.89
Garden,Tap Water(A-3 Building)	CH/W/20/126	7.5	24.6	582	1215	73.016
Tap Water(H-1 Building)	CH/W/20/127	8.01	25.5	388	569	50.69
RO Water, 1 <sup>st</sup> Floor(A-7 Building)	CH/W/20/128	7.45	26.3	25.3	65	10.56

### Final Disposal Point

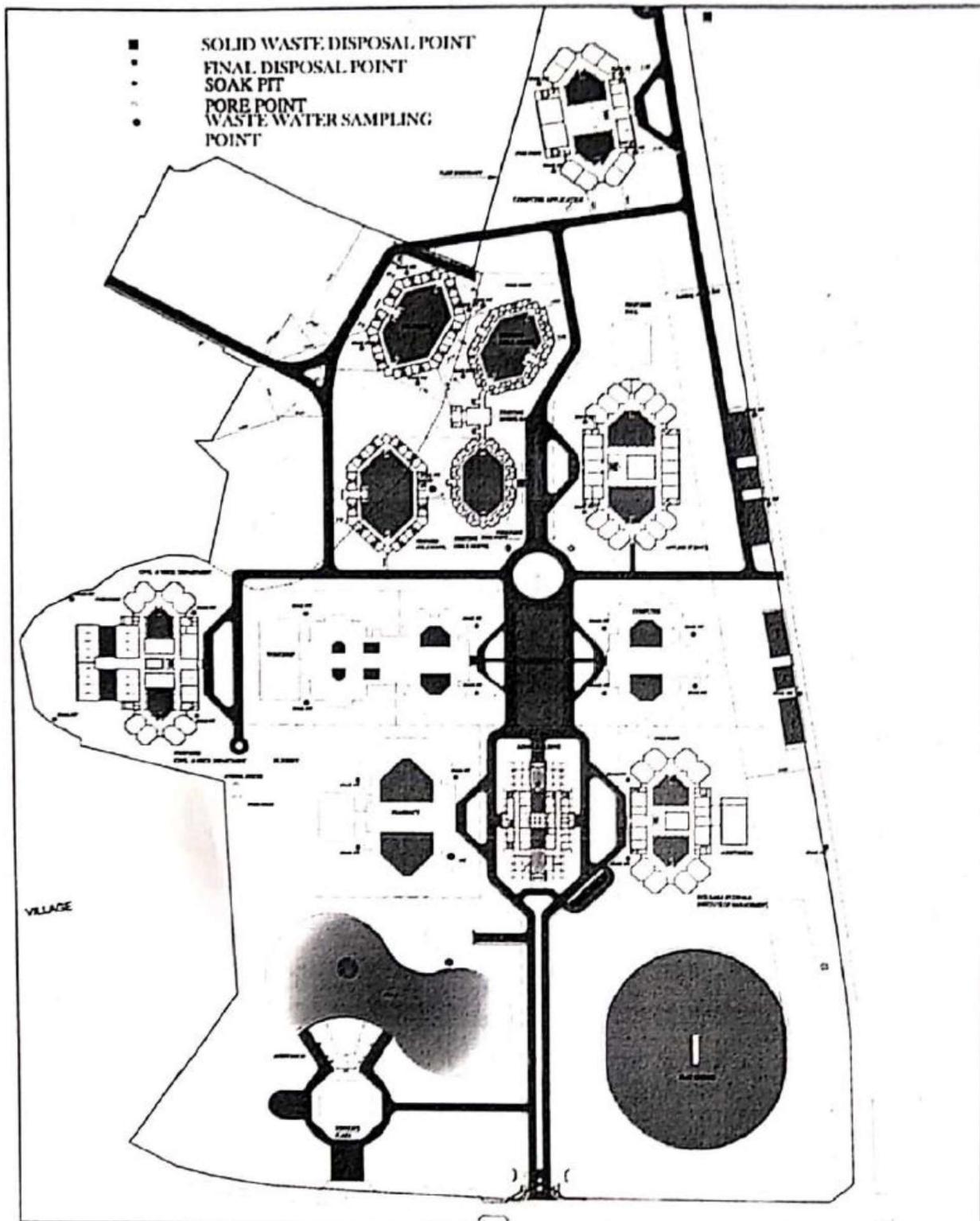


Fig 5: Site Plan of CHARUSAT mentioning location of Soak Pits/ Sampling points, etc.



## ANNEXURE –6

### DETAILS OF FLUE GAS STACKS

Sr. No.	Stack attached to	Fuel	Height of the stack	Air pollution Control device
1	Hostel-1 & 2	Diesel	11	-----
2	Hostel-3 and MCA Building Auditorium	Diesel	11	--
3	RPCP Building	Diesel	11	-----
4	PDPIAS Building	Diesel	11	-----
5	PDPIAS Auditorium	Diesel	11	-----
6	PDPIAS VSM Lab	Diesel	11	-----
7	Admin Building & EC/EE Building	Diesel	11	-----
8	CE/IT Building & ME/Civil Building	Diesel	11	-----
9	CE/IT Building Win cell Department	Diesel	11	-----



## ANNEXURE – 7

### THE QUALITY OF EMISSION FROM EACH FLUE GAS STACK

#### First Monitoring

FLUE GAS STACKS							Pollutants, mg/Nm <sup>3</sup>		
No.	Location	Stack Attached to	Date	Flue Gas Temp. in °K	Flue Gas Velocity in m/s	PM	SO <sub>2</sub> ppm	NO <sub>x</sub> Ppm	
							PM	SO <sub>2</sub> ppm	
1.	Hostel-3	D.G.Set (100 KVA)	17.06.2020	371.2	9.36	55.3	20.4	38	
2.	PDPIAS Building	D.G.Set (82.5KVA)	17.06.2020	424	11.52	48.5	15	42	
3.	PDPIAS Auditorium	D.G.Set (50 KVA)	17.06.2020	353.1	12.32	28.4	12	35	
4.	PDPIAS VSM Lab	D.G.Set (50 KVA)	17.06.2020	355.2	12.91	56.3	09	45	
5.	Admin & EC/EE Building	D.G.Set (200 KVA)	17.06.2020	356.2	14.46	57.6	12	38	
6.	CE/IT Building, Wincell Dept.	D.G.Set (82.5KVA)	17.06.2020	383	13.41	56.4	20	45	
7.	Hostel 1& 2	D.G.Set (45 KVA)	17.06.2020	358	14.49	45.5	15	45	
8.	RPCP Building	D.G.Set (20 KVA)	17.06.2020	355	17.08	38.4	12	30	

#### Second Monitoring

FLUE GAS STACKS							Pollutants, mg/Nm <sup>3</sup>		
No.	Location	Stack Attached to	Date	Flue Gas Temp. in °K	Flue Gas Velocity in m/s	PM	SO <sub>2</sub> ppm	NO <sub>x</sub> Ppm	
							PM	SO <sub>2</sub> ppm	
1.	Hostel-3	D.G.Set (100 KVA)	21.10.2020	371.4	17.47	50.2	22	42	
2.	PDPIAS Building	D.G.Set (82.5KVA)	21.10.2020	385	17.35	42.5	18	38	
3.	PDPIAS Auditorium	D.G.Set (50 KVA)	21.10.2020	351	15.72	32.5	15	40	
4.	PDPIAS VSM Lab	D.G.Set (50 KVA)	21.10.2020	358.4	14.50	45.5	14	42	
5.	Admin & EC/EE Building	D.G.Set (200 KVA)	21.10.2020	359.3	15.91	53.4	13	45	
6.	CE/IT Building, Wincell Dept.	D.G.Set (82.5KVA)	21.10.2020	373.5	16.21	58.4	22	43	
7.	Hostel 1& 2	D.G.Set (45 KVA)	21.10.2020	358.4	16.32	40.8	20	40	
8.	RPCP Building	D.G.Set (20 KVA)	21.10.2020	353.2	14.87	32.6	10	35	



### Third Monitoring

FLUE GAS STACKS								
No.	Location	Stack Attached to	Date	Flue Gas Temp. in °K	Flue Gas Velocity in m/s	Pollutants, mg/Nm <sup>3</sup>		
						PM	SO <sub>2</sub> ppm	NO <sub>x</sub> Ppm
1.	Hostel-3	D.G.Set (100 KVA)	23.12.2020	368.2	16.10	48.3	25	40
2.	PDPIAS Building	D.G.Set (82.5KVA)	23.12.2020	392.5	16.63	40.6	20	45
3.	PDPIAS Auditorium	D.G.Set (50 KVA)	23.12.2020	354.2	14.89	30.5	18	42
4.	PDPIAS VSM Lab	D.G.Set (50 KVA)	23.12.2020	356.5	15.85	50.4	18	40
5.	Admin & EC/EE Building	D.G.Set (200 KVA)	23.12.2020	358.2	14.49	49.6	15	48
6.	CE/IT Building, Wincell Dept.	D.G.Set (82.5KVA)	23.12.2020	376.5	14.16	46.3	11	43
7.	Hostel 1& 2	D.G.Set (45 KVA)	23.12.2020	359.5	16.35	42.8	22	43
8.	RPCP Building	D.G.Set (20 KVA)	23.12.2020	350.5	16.14	35.8	12	38



## ANNEXURE -8

### AMBIENT AIR QUALITY WITHIN THE FACTORY PREMISES

1 <sup>st</sup> Monitoring				
Locations	Nr.Nursing	Nr.Physiotherapy	Nr. MCA Department	Nr. Civil Department
Date	18.06.2020	18.06.2020	22.10.2020	22.10.2020
Duration in Minutes	1440	1440	1440	1440
PM <sub>2.5</sub> ( $\mu\text{g}/\text{M}^3$ )	15.48	35.32	24.36	40.35
PM <sub>10</sub> ( $\mu\text{g}/\text{M}^3$ )	32.28	---	30.2	---
SO <sub>x</sub> ( $\mu\text{g}/\text{M}^3$ )	10.86	---	12.36	---
NO <sub>x</sub> ( $\mu\text{g}/\text{M}^3$ )	4.52	---	2.12	---



**ANNEXURE –9**  
**QUANTITY, SOURCES & COMPOSITION OF HAZARDOUS**  
**WASTE/SOLID WASTE**

Solid Waste Generation		
Sr No.	AREA	QUANTITY OF DAY (kg)
	Food Courts	
1	Danny	6
2	Ice berg	4
3	Krishna	12
4	Sweet spot	3
5	Nescafe	2
6	Tea Post	6
7	Lalabhai Sevsal	5
8	Canteen	30
9	Mess	75
10	Papelon	22
11	Civil/ME	19
12	EE/EC	16
13	Depstar	28
14	Pharmacy	26
15	Admin	12
16	IIIM	20
17	PDPIAS	39
18	CMPICA	8
19	Hostels	135
20	ARIP	16
21	Nursing	19
22	Campus Roads	50
<b>Total</b>		<b>553 Kg</b>



## ANNEXURE -10

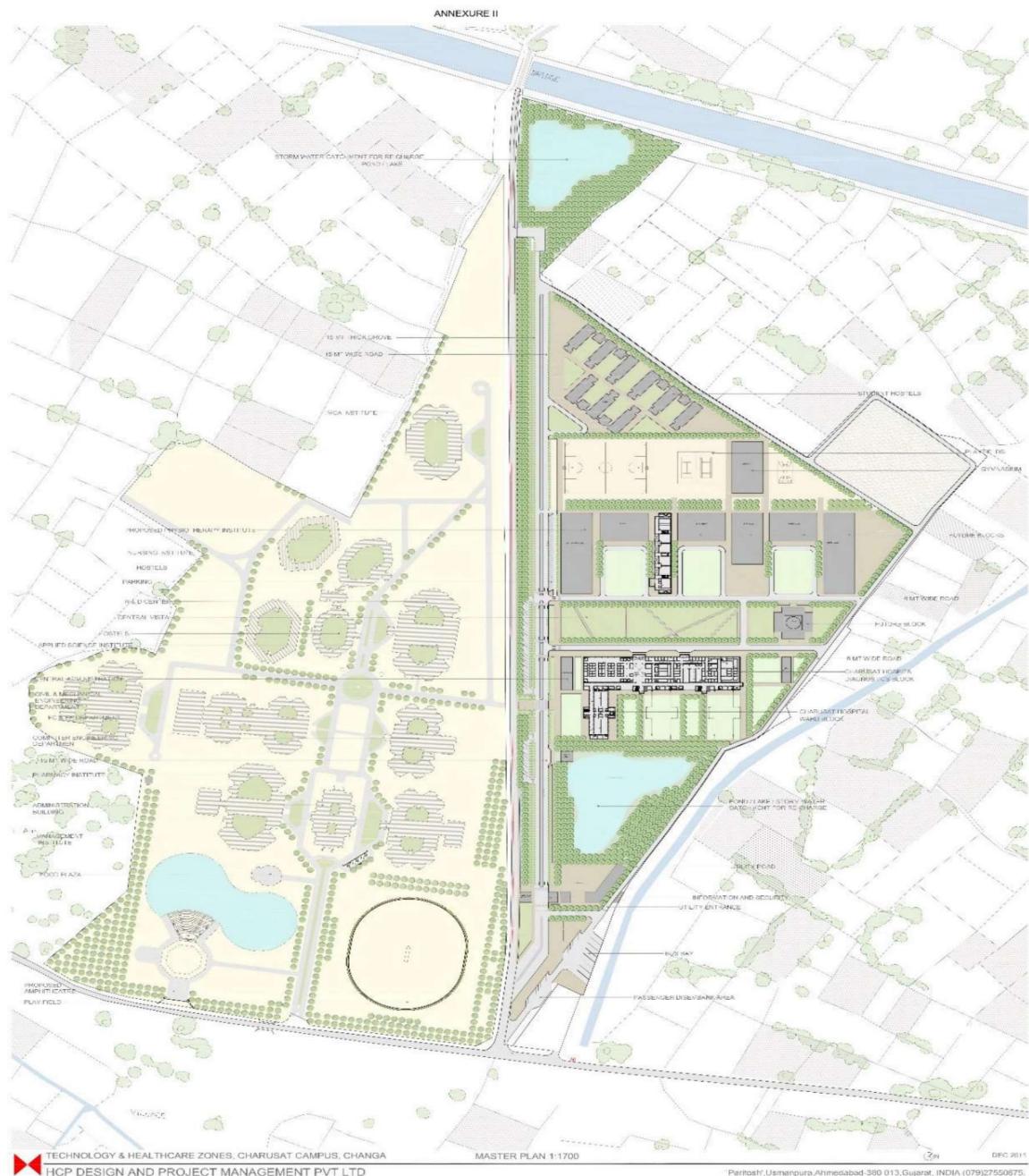
### BIOMEDICAL WASTE CERTIFICATE

<b>SAMVEDNA B.M.W. INCINERATOR</b> (Unit-II)		
GUJARAT POLLUTION CONTROL BOARD AUTHORISED CBMWTF		
Reg. Add.: 106, 1st Floor, Sakar Complex, Godhra Road, Near Rinku Chokdi, Halol, Panchmahal, Gujarat. Ph. No.: 02676 224997 Help Line No.: 8141366333 E-mail: samvednain@gmail.com, www.samvednainc.com Plant : Plot No. 208/3, Moraj-Chikhala Road, At. & Po. Moraj Village, Ta. Tarapur, Dist. Anand. Pin : 388 180		
<b>CERTIFICATE</b>		
This is to certify that <u>Charusat Hospital</u>		
Dr. / In-charge : <u>Shri Dilipbhai Patel</u>		
Located at the address : <u>Charusat Campus, Changa</u>		
Taluka: <u>Petlad</u>	Dist: <u>Anand</u>	Pincode: <u>388421</u>
No. of Bed: <u>150</u>		
Is registered with us for the specific purpose of Management & Handling of Bio-Medical Waste; generated at above Health Care unit as per Pollution Control Board rules.		
Samvedna Reg. ID No.: PT- 2316	Valid Upto: 31-07-2021	GPCB - ID 366659
Place : Changa	For Samvedna Bmw Incinerator	
Date : 22-07-2020	Partner	



## ANNEXURE – 11

### SITE PLAN



Site Plan of CHARUSAT Campus



## ANNEXURE – 12

### DETAILS OF NOISE MONITORING

Date of Sampling		18-02-2021
No.	Locations	Reading dB(A) (Day time 6:00 am to 10:00 pm)
1.	Near Civil Building	58
2.	Near Mechanical Workshop	52
3.	Near Kamlaben Girls Hostel	48
4.	Near Tapas Hall	58
5.	Near Girls Hostel-3	46
6.	Near MCA Building	59
7.	Near Main Gate Parking	58
8.	Near Student Store	68
9.	Near Main Gate(Karoli)	70
10.	Near Amul(Hospital)	65
11.	Near ARIP & Nursing Center	53
12.	Near CHRF Hospital	64
13.	Near CHRF Hospital H <sub>2</sub>	60
14.	Near Volleyball Court	58
15.	Near Main Ground	62
16.	Near Main Gate (Changa)	65
17.	Near Pond	48
18.	Near Admin & Canteen	58
19.	Near MBA Building	56
20.	Near Centre Loan	60
21.	Near PDPIAS	66



## ANNEXURE –13

### GROUP INSURANCE POLICY

Policy Schedule

		Policy Servicing Office	SBU	52				
<b>IFFCO-TOKIO General Insurance Company Limited</b> Regd. Office: IFFCO SADAN,C1 Distt Centre ,Saket,New Delhi-110017		IFFCO-TOKIO General Insurance Co. Ltd., 1st Floor, House No. A, 21st Century Business Centre,Near World Trade Centre,Ring Road,Surat,Gujarat.395002						
Corporate Identification Number (CIN) U74899DL2000PLC107621, IRDA Reg. No. 106								
<b>Group Personal Accident Insurance Policy Schedule</b>								
	<b>CUM TAX INVOICE</b>							
<b>Insured</b>	<b>CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY.</b>							
<b>Address</b>	CHAROTAR CAMPUS, AT. CHANGA, TA- PETLAD DIS. ANAND-388421							
<b>GSTIN</b>		<b>State Code</b>	24	<b>from 00.00 hours on</b>				
<b>Phone No</b>		<b>Agent Code</b>	52001446	<b>To Mid Night on</b>				
<b>28/06/2021</b>								
<b>Total Members Covered</b>	<b>625</b>	<b>Co-insurance Details</b>						
<b>Intra State</b>								
<b>Premium Details</b>		<b>IFFCO TOKIO General Insurance Co. Ltd.</b>		<b>100%</b>				
<b>Taxable Value</b>	<b>153,234</b>							
<b>CGST @ 9%</b>	<b>13,791</b>							
<b>SGST @ 9%</b>	<b>13,791</b>							
<b>IGST @ 18%</b>	<b>-</b>							
<b>Total Value</b>	<b>180,816</b>							
<b>Policy Conditions/ Extensions/ Endorsements</b>								
<b>Group Composition:</b>	Employees of the Insured							
<b>Basis of Policy</b>	Unnamed Cover							
<b>Table "A": Benefit 1, Table "B1": Benefit 1-4, Table "B": Benefit 1-5, Table "C": Benefit 1-6</b>								
<b>Coverage</b>	<b>Table "B1 &amp; "C"</b>							
<b>Day 1 cover for new Joinees</b> is allowed subject to receipt of premium / sufficient CD balance as on effective date of cover and declaration by 15th of every succeeding month.								
<b>Refund of premium on account of Mid -term Deletion</b> of Members is allowed from the date of separation subject to receipt of intimation by 15th day of every succeeding month failing which refund will be calculated from the date of submission of intimation to ITGI. No refund is allowed in case of claim preferred on ITGI.								
<b>Communicable Disease Exclusion Clause:</b> - Losses or damages caused directly or indirectly due to any infectious or contagious disease, pandemic /epidemics as declared by WHO and / or Government of India will be an exclusion under this policy as per the attached clause.								
<b>Age Group:</b> 18 yrs to 65 yrs								
If at the time of the claim it is discovered that persons in a cadre/designation are more than the group strength covered under the policy, the claim shall be repudiated								
<b>Accidental Medical Extension :</b> Actual expenses incurred or <b>Rs 50,000/-</b> whichever is lower. (Linked to the PA disability Claim admissible under the policy).								
<b>Accidental Medical Extension (Only OPD) :</b> Actual expenses incurred or <b>Rs 5,000/-</b> whichever is lower. (Not Linked to the PA disability Claim admissible under the policy).								
<b>The policy will be</b> subject to half yearly declaration cum adjustment clause.								



The entire strength of a cadre should be covered. No selectivity will be allowed. The client should maintain daily attendance records / muster rolls and make the same available on request. If at the time of the claim it is discovered that persons in a designation are more than covered under the policy, the claim will be repudiated and no requests for accommodation will be entertained.

**In case** employee/employer relationship is not there, claim will be paid directly to the beneficiary.

Subject otherwise to the terms, conditions, exceptions and limitations of this policy.

- The coverage is as per policy wordings / endorsements / clauses attached. Please go through the Group Personal Accident Insurance Policy and in case of any discrepancy, please inform us.

- Policy is cancelled ab-initio in case of Cheque Dishonour.

1)"Policy Issuing Office: Delhi"

2) " Consolidated Stamp Duty deposited as per the order of Government of National Capital Territory of Delhi"

Toll Free: 1800-103-5499 (24 hours all days) or SMS  
"CLAIM" to 56161.

Service Tax No : AAACI7573HST001

For IFFCO-TOKIO General Insurance Co. Ltd

  
Authorized Signatory

SR No.	Location	No of Staffs			Personal Accident Policy Format Name of Lives	Designation	Dept	Sum Insured Individual SI	Table B1 & Table C each Normal	200000 Heavy
		Normal	Heavy	Total						
1	Surat	535	90	625	Unnamed	Lives	University	Sum Insured B1	107000000.00	18000000.00
								Sum Insured C	107000000.00	18000000.00



## ANNEXURE –14

### DETAILS OF CSR ACTIVITIES

- Students are encouraged to work with the local communities of the adopted villages by CHARUSAT's Rural Education Development Cell in areas like solid waste management, reduction of plastics use, and conversion of plastic waste as well as paper waste to more valuable products
- There were also studies of environmental health problems in the local communities and steps needed to mitigate these problems. A closely related area is "Environmental Service-Learning" whereby student interns could learn about environmental problems while studying the environment of local communities.
- 7th Charotar Crocodile Count in the Wetlands of Anand and Kheda Districts is being organized during January, 2020.
- Petlad Nagpalika's Waste Management and Plastic Pyrolysis plant study
- Swatchta Action Plan in CHARUSAT adopted villages in July 2020
- Recycled Paper Pen making training to nearby village women



## ANNEXURE –15

### ENVIRONMENT MANAGEMENT PLAN (EMP)

By understanding the dynamics of present situation of resource utilization and current practices of waste disposal, the Environmental Engineering Lab has prepared an Environment Management Plan for the University. This plan will reveal the strengths and weaknesses and suggests remedies to develop green and clean campus. The EMP also gives suggestion for the priority of work to carry out.

**Environment Management Plan 2019-20 to 2023-24**

Sector	Strengths	Weakness	Suggestions	Priority
<b>1. Paper</b>	<ul style="list-style-type: none"><li>• Use of green computing practices</li><li>• Use of one sided papers in main building and many departments.</li><li>• Paperless Digital Exam</li><li>• The convocation process also involves online system.</li><li>• The administration use emails and online payment.</li></ul>	<ul style="list-style-type: none"><li>• Multiple number of copies required for office work.</li><li>• More number of departments and affiliated colleges where circulars to be sent.</li><li>• Multiple copies of Project Report and Internship Reports</li></ul>	<ul style="list-style-type: none"><li>• Towards paperless office: more use of e-mails, e-money transfer and advance IT technology for communication.</li><li>• Pulping of major portion of papers i.e. answer sheets, bills and other administrative papers.</li></ul>	<b>Medium</b>



		<b>Medium</b>
<b>2. Plastic</b>	<ul style="list-style-type: none"><li>• Recycling and reuse of plastic at some departments.</li><li>• Incineration in controlled conditions</li></ul>	<ul style="list-style-type: none"><li>• Sometimes plastic items are thrown with general waste.</li><li>• The plastic covering of dispatched laboratory equipment boxes and other items are unavoidable.</li><li>• Sometimes plastic bottles and bags are required for water and soil sampling which is unavoidable as per the protocol.</li><li>• Distribution of RO water through plastic cans.</li></ul> <ul style="list-style-type: none"><li>• Segregation of waste at the source and sending plastic waste for recycling.</li><li>• Total Plastic ban on campus.</li><li>• In all functions the plastic mineral water bottles, tea cups, straws, bouquets and gifts with plastic covering, decorations, etc. unnecessary plastic use is avoided.</li></ul>
<b>3. Biodegradable waste</b>	<ul style="list-style-type: none"><li>• Segregation of Plant Waste and Paper Waste</li></ul>	<ul style="list-style-type: none"><li>• Burning of dry bio-degradable waste at some places.</li></ul> <ul style="list-style-type: none"><li>• Composting of all bio-degradable waste at various places by Garden section and using it for nursery, plantation and gardening.</li><li>• The kitchen waste generated in hostel kitchens should be utilized for compost production or biogas generation.</li></ul>



<b>4. Glass waste</b>	<ul style="list-style-type: none"> <li>Reuse of bottles at some departments for storage of chemicals.</li> </ul>	<ul style="list-style-type: none"> <li>Throwing of glass waste with regular waste though it is recyclable.</li> <li>Sometimes the glasses of windows and doors crack suddenly which produce glass waste.</li> </ul>	<ul style="list-style-type: none"> <li>Maximum reuse of bottles.</li> <li>Sending the broken glass for recycling.</li> </ul>	<b>High</b>
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<b>Energy</b>				
<b>Sector</b>	<b>Strengths</b>	<b>Weakness</b>	<b>Suggestions</b>	<b>Priority</b>
<b>5. Electricity</b>	<ul style="list-style-type: none"> <li>Installation of solar panels for production of electricity</li> <li>Use of LED lamps With sensors</li> <li>Most of the buildings are well constructed considering the need of illumination and ventilation which reduces the use of electricity.</li> </ul>	<ul style="list-style-type: none"> <li>Insufficient use of solar energy for electricity generation.</li> <li>Unnecessary use of lights, fans and computers at some places when no one is using.</li> </ul>	<ul style="list-style-type: none"> <li>Electrification of street lights by solar power.</li> <li>Use of solar pumps for water tanks.</li> <li>Use of electricity efficient equipment for laboratory and office use.</li> </ul>	<b>Medium</b>



	<b>6. Fuel</b> <ul style="list-style-type: none"><li>• Use of Bicycles on university campus</li></ul>	<ul style="list-style-type: none"><li>• Hostels using high quantity of LPG fuel for their kitchens.</li><li>• The biogas generation plant can be helpful to the hostel kitchens.</li><li>• General awareness about efficient use of fuel.</li><li>• No Vehicle Day" on first Saturday of every month which saves fuel.</li></ul>	<b>Medium</b> <ul style="list-style-type: none"><li>• "Cycle on rent" service for students will be beneficial.</li><li>• The biogas generation plant can be helpful to the hostel kitchens.</li><li>• General awareness about efficient use of fuel.</li><li>• No Vehicle Day" on first Saturday of every month which saves fuel.</li></ul>
	<b>7. Water Utilization</b>	<ul style="list-style-type: none"><li>• Water Purifiers on campus to filter water.</li><li>• Maximum water self-sufficiency by watershed management and harvesting</li></ul>	<ul style="list-style-type: none"><li>• Overflowing of tanks at some places</li><li>• Fitting of old taps in toilets</li><li>• Leakages not repaired on time.</li></ul> <ul style="list-style-type: none"><li>• Installation of water guards or sensors at overhead water tanks to avoid overflowing losses.</li><li>• Proper and timely maintenance of plumbing.</li><li>• Installation of rain water harvesting assembly at every department.</li></ul>



Hazardous Waste				
Sector	Strengths	Weakness	Suggestions	Priority
<b>8. Chemical waste</b>	<ul style="list-style-type: none"><li>The practical protocols are set to use minimum quantity of chemicals for the routine practical.</li><li>Microbial waste thrown out after proper disinfection measures at every departments dealing with microorganisms.</li></ul>	<ul style="list-style-type: none"><li>No proper disposal method for hazardous chemicals wastes.</li></ul>	<ul style="list-style-type: none"><li>Hazardous chemical waste should be transferred to disposal facility center.</li></ul>	<b>High</b>
<b>9. E-waste</b>	<ul style="list-style-type: none"><li>Regular disposal of e-waste through certified e-waste collection agency.</li></ul>	<ul style="list-style-type: none"><li>E-waste is thrown along with regular waste, some material in e-waste can be hazardous and most of it can be recycled.</li></ul>	<ul style="list-style-type: none"><li>There must be segregation of e-waste from regular waste at source.</li><li>Precious metal recovery can be possible by university laboratories.</li></ul>	<b>High</b>



Air				
Sector	Strengths	Weakness	Suggestions	Priority
10. Air	<ul style="list-style-type: none"> <li>University has ample amount of green cover for maintaining fresh atmosphere.</li> </ul>	<ul style="list-style-type: none"> <li>The construction activities and burning of waste on the University campus are adding contamination of ambient air quality.</li> </ul>	<ul style="list-style-type: none"> <li>The precautions like water sprinkling or use of enclosures should be made to reduce the particulate matter in air during construction activity.</li> </ul>	Low
Noise				
Sector	Strengths	Weakness	Suggestions	Priority
11. Noise	<ul style="list-style-type: none"> <li>University is located away from noisy area of city.</li> <li>The tree cover absorbs the noise of highway traffic.</li> </ul>	<ul style="list-style-type: none"> <li>The construction activities like excavation, digging, hammering, welding, transportation, loading and unloading operations. are responsible for ambient noise which disturbs the routine classes and research activities.</li> </ul>	<ul style="list-style-type: none"> <li>Silent zone rules be followed.</li> <li>The noise producing activities should be done during the holidays or after the office hours.</li> <li>The contractor should be advised to use less noisy machines.</li> </ul>	Low



# **Environmental Engineering Laboratory**

*Schedule-I Environment Auditor (GPCB Recognized)*

M. S. Patel Department of Civil Engineering, CSPIT, CHARUSAT

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## **Adequacy Certificate of Environmental Management System**

The Environmental Engineering Laboratory, M. S. Patel Department of Civil Engineering, **Charotar University of Science & Technology, Changa** is recognized by the GPCB, Gandhinagar under the Environmental Audit Scheme introduced by the Hon'ble High Court Gujarat, vide its orders dated 20/12/1996 and 13/3/1997 and modified order dated 16/9/1999, as an environmental auditor for the purpose of the auditing, having carried out Environmental audit of,

- **M/s. Charotar University of Science & Technology**
- **Located at: Changa, Anand, Gujarat 388421**

Having completed the environmental audit based on personal monitoring, and audit report, prepared as per Environmental Audit Scheme, it is certified that the Environmental Management System (EMS) provided by the University is Adequate & Efficient to achieve the quality of effluents (Air + Wastewater + Solid Waste).

### **Name & Address of the Environmental Auditor**

Environmental Engineering Laboratory, M. S. Patel Department of Civil Engineering, CHARUSAT Campus, Changa, Dist.: Anand, State: Gujarat - 388 421

### **Signature of Environmental Auditor**

Sr. No.	Name & Designation	Sign
1	<b>Mr. Gaurav V. Kapse</b> (Environmental Engineer)	
2	<b>Mr. Gaurav R. Patel</b> (Chemical Engineer)	
3	<b>Dr. Seema Amin</b> (Microbiologist)	
4	<b>Mr. Jinit R. Patel</b> (Chemist)	

Date: 12/04/2021

Place: Changa, Anand