

7.1.6: Quality audits on environment and energy are regularly undertaken by the Institution and any awards received for such green campus initiatives:



GREEN AUDIT REPORT



RAJA MADHUSUDAN DEV DEGREE COLLEGE, PATIA, BHUBANESWAR



PRESENTED BY:

DEPARTMENT OF BOTANY



ACKNOWLEDGEMENT

This project work would not have been possible without the guidance and help of several individuals who has contributed and extended their help to accomplish it's goal.

We express our deep sense of gratitude to our college, RMD Degree college of science and education, patia, for it's keen support.

We are eminently grateful to our **Principal, Shri. Prasant Kumar Rout** Sir and the **IQAC Department** of our college for their valuable guidance, co-operation, and encouragement, that helped us a lot in execution of this project and to make it a infallible success.

Last but not the least , we conclude by thanking everyone wholeheartedly, who helped us to clinch the project within the restricted time frame .

ABSTRACT

The project “green audit” aims to analyse the environmental correlation, which will have an impact on the eco-friendly ambience. The main objective of the project “green audit” is to promote the environment management and conservation in our college campus. In our project we had focus on counting the status of floras in our campus basing upon three categories – Tree, Herb and Shrub, calculating the oxygen produced by the floras and the carbon dioxide emitted by total persons, vehicles and electronic gadgets per week in an approximate value. We prepared an estimated data consisting of 2243 and 1355 numbers of plants (trees, herbs and shrubs) and persons respectively in our campus having 15.47 acres of area. So as per our study and calculation, amount of oxygen released by the total plants and the carbon dioxide released by the total persons, vehicles and electronic gadgets are 48,67,000 and 38,000 litres per week respectively. By comparing the values of production of O₂ to CO₂ we concluded that the amount of O₂ is enormous as compared to the amount of CO₂ produced in the campus. This concludes that our Campus environment is an quite green environment.

INTRODUCTION:-

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of institute. It aims to analyse environmental practises within and outside of the concerned place, which will have an impact on the eco-friendly atmosphere. Green Audit is useful tool for college to determine how and where they are using the most energy or water or resources.

It can create health consciousness and promote environmental awareness, values and ethics. It could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. It is part of corporate social responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through carbon foot print reduction measures.

OBJECTIVES

The main objective of the Green Audit is to promote the environment management and conservation in the RMDD College Campus, Patia, BBSR.

In Recent time, the Green Audit of an institution has been becoming a paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. Our environment is clean since its inception. Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework.

The main objectives of carrying out Green Audit are in order to perform green audit included different tools such as preparation of physical inspection of the campus observation and review of the documentation data analysis, measurements and recommendations.

- Review Background information
- Green area management
- Energy conservation
- Oxygen level & Emission of Carbon Dioxide

MATERIAL METHOD

The project was done in our college campus by the students with assistance of faculties of department of Botany RMD Degree College, Patia, BBSR. Three groups of students each having 4 students or participants. We measured both length & width of all the plants using a measurement tape identified them with the help of flora book, then categorised them into trees, herbs and shrubs. Then we analysed which one was a flowering plant or which one was a non – flowering plant. Later we prepared a list according to their square feet & campus area. we also made the final list of student strength according the data we have.

CAMPUS AREA	15.47 acres
STUDENT STRENGTH	1248
STAFF	47
TOTAL PERSONS	1355

Table-1**ANALYSIS**

<u>Sl No.</u>	<u>Plant Name</u>	<u>No. Of Plants</u>	<u>Plant Type</u>	<u>Length</u>	<u>Width</u>	<u>Flowering/Non-Flowering</u>
1	Pinanga	1	Herb	40 cm	30 cm	Flowering
2	Libidibia ferrea	1	Shrub	120 cm	10 cm	Flowering
3	Neem	20	Herb	40-50 cm	27 cm	Flowering
4	Holarrhena pubescens	2	Tree	15 m	25 cm	Flowering
5	Strobilanthes crispa	2	Herb	20-23 cm	3 cm	Flowering
6	Heliotropium indicum	4	Herb	11-16 cm	1-2 cm	Flowering
7	Ayahuasca	1	Herb	35 cm	2 cm	Non-Flowering
8	Sida rhombifolia	20	Herb	30-48 cm	0.1-2 cm	Flowering
9	Bell peper	5	Herb	28-33 cm	0.1-1 cm	Non-Flowering
10	Wood Apple	7	Herb	45 cm	0.1 cm	Non-Flowering
11	Naroca	1	Shrub	200 cm	8 cm	Flowering
12	Mango	14	Tree	9 m	4 cm	Flowering
13	Premna serratifolia	7	Herb	12-70 cm	1-5 cm	Non-Flowering
14	Binunga	1	Herb	80 cm	3 cm	Flowering
15	Tiliacora triandria	20	Herb	18-25 cm	2 cm	Flowering
16	Clausena	1	Shrub	40 cm	2 cm	Non-Flowering
17	Albizia adianthifolia	1	Shrub	80 cm	3 cm	Non-Flowering
18	Sida	50	Herb	40-50 cm	0.5 cm	Flowering
19	Bitter Bush	1	Shrub	60 cm	1 cm	Non-Flowering
20	Bush Beans	1	Herb	35 cm	2 cm	Non-Flowering
21	Albizia chinesis	3	Tree	4 m	15-25 cm	Non-Flowering
22	Jack Fruit	5	Tree	3.6 m	160-170 cm	Non-Flowering
23	Chakunda	2	Tree	5 m	190 cm	Flowering
24	Brosium rubescens	1	Tree	10 m	58 cm	Non-Flowering
25	Aralia dasyphylla	1	Tree	7 m	36 cm	Non-Flowering
26	Breynia	1	Shrub	1.7 m	5 cm	Flowering
27	Piscidia piscipula	1	Tree	2.3 m	17-18 cm	Non-Flowering
28	Plume albizia	2	Tree	3 m	15 cm	Non-Flowering
29	Bajramuli	600	Shrub	0.02-1.7 m	3 cm	Flowering
30	Green gulmohar	1	Shrub	1.3 m	6 cm	Flowering
31	Hymenobium pulcherium	2	Tree	3.6 m	96 cm	Flowering
32	Chinese tallow	1	Tree	7.6 m	9-13 cm	Flowering
33	Tamarind	1	Tree	3.7-4 m	60-70cm	Flowering
34	Alvaradoa amorphoides	1	Tree	5-6 m	75 cm	Flowering
35	Ehretia anaccea	1	Tree	2 m	9 cm	Flowering
36	Macaranga gigantea	1	Tree	4-6 m	75 cm	Flowering
37	Teak	1	Tree	6-7 m	75-93 cm	Flowering
38	Mango Tree	17	Tree	3 m	1 m	Flowering
39	Brinjal	1	Shrub	30 cm	2 cm	Flowering
40	Lady's Glove	3	Shrub	20 cm	5 cm	Flowering
41	Hibiscus	70	Shrub	1.8 m	55 cm	Flowering
42	Avocado	6	Tree	3.5 m	16 cm	Flowering
43	Papaya	1	Tree	1.5 m	22 cm	Flowering
44	Basil	2	Shrub	1 m	50 cm	Flowering
45	Marigold	50	Shrub	15 cm	5 cm	Flowering
46	Nyctanthes arbortristis	4	Shrub	182.88 cm	50.8 cm	Flowering
47	Chilli	1	Shrub	60.96 cm	50.80 cm	Flowering
48	Touch me not	20	Herb	10 cm	5 cm	Flowering
49	Tulsi	23	Herb	135-150 cm	3-7 cm	Flowering

50	Cedar	12	Tree	487.68 cm	17.78 cm	Non-Flowering
51	Tracina reflection	3	Shrub	914.40 cm	2.54 cm	Non-Flowering
52	Ficus triangularis	300	Shrub	30.48 cm	12.70 cm	Non-Flowering
53	Ocatea tuberula	22	Tree	30.48 cm	25.40 cm	Non-Flowering
54	Durant	17	Shrub	457.20 cm	20 cm	Non-Flowering
55	Drumstic leaves	1	Tree	30.48 cm	30cm	Flowering
56	Jasmine	7	Shrub	518.16 cm	30.48 cm	Flowering
57	Marvel of peru	20	Shrub	80-120 cm	40 cm	Flowering
58	Champak	2	Shrub	91.44 cm	5.08 cm	Flowering
59	Cashew	1	Tree	152.40 cm	5.08 cm	Flowering
60	Rubber Fig	16	Shrub	670.56 cm	25.40 cm	Non-Flowering
61	Eucalyptus	11	Tree	656-670 cm	55.88 cm	Flowering
62	Cacao	3	Tree	457.20 cm	68.58 cm	Non-Flowering
63	Caesapinih	13	Tree	762 cm	81.28 cm	Non-Flowering
64	Simarouba	1	Tree	609.60 cm	60.96 cm	Non-Flowering
65	Bouganvillae	15	Shrub	914.40 cm	5.08 cm	Flowering
66	Guava	1	Tree	91.44 cm	7.62 cm	Flowering
67	Camma discolour	30	Shrub	167.64 cm	15 cm	Flowering
68	Noni	1	Shrub	30.48 cm	38.10 cm	Flowering
69	Creepginjea	1	Shrub	182.88 cm	15 cm	Flowering
70	Kalenchoe pinnata	5	Shrub	60.96 cm	76.20 cm	Flowering
71	Coleus	19	Shrub	30.48 cm	30 cm	Flowering
72	Japonnius	30	Shrub	91.44 cm	2.2 cm	Non-Flowering
73	Saltwood	11	Shrub	60.96 cm	30.48 cm	Non-Flowering
74	Krantom	4	Tree	60.96 cm	25.40 cm	Non-Flowering
75	Coconut	21	Tree	548.64 cm	56-95 cm	Flowering
76	Randia	3	Herb	914.4 cm	15 cm	Non-Flowering
77	Olender	9	Tree	91.44 cm	25.40 cm	Flowering
78	Madagascar periwinkle	7	Tree	213.36 cm	12.70 cm	Flowering
79	Weeping fig	2	Tree	213.36 cm	15 cm	Flowering
80	Pentas lanciolata	5	Herb	182.88 cm	10 cm	Flowering
81	Magnifera indica	1	Herb	60.96 cm	15 cm	Flowering
82	Wodgetia	1	Tree	30.48 cm	5 cm	Non-Flowering
83	Pokekelodi	10	Tree	304.80 cm	5 cm	Non-Flowering
84	Agapanthum	2	Herb	121.92 cm	15 cm	Non-Flowering
85	Manfaatdaun	1	Shrub	60.96 cm	20 cm	Non-Flowering
86	Artaborts	1	Tree	152.40 cm	121.92 cm	Non-Flowering
87	Saribumtundifolius	1	Herb	457.20 cm	15 cm	Non-Flowering
88	Aricapalm	41	Shrub	121.92 cm	30 cm	Non-Flowering
89	Fucus lirata	2	Shrub	121.92 cm	30 cm	Non-Flowering
90	Alium holandrium	2	Herb	152.40 cm	5 cm	Non-Flowering
91	Costus	15	Shrub	30.48 cm	15 cm	Non-Flowering
92	Nicotina rustica	4	Shrub	167.64 cm	5 cm	Non-Flowering
93	Dracaena trifascata	12	Herb	167.64 cm	15 cm	Non-Flowering
94	Xanthoscamum	5	Herb	91.44 cm	5 cm	Non-Flowering
95	Surinam Cherry	2	Shrub	60.96 cm	7 cm	Non-Flowering
96	Cactus	2	Shrub	182.88 cm	30 cm	Flowering
97	Alovera	7	Herb	182.88 cm	5 cm	Non-Flowering
98	Rubber tree	2	Tree	60.96 cm	5 cm	Non-Flowering
99	Amla	1	Tree	167.64 cm	7 cm	Flowering
100	Cascabela	1	Tree	548.64 cm	30.48 cm	Flowering
101	Curry leaves	3	Herb	167.64 cm	5 cm	Non-Flowering
102	Artabotorys siamens	1	Herb	30.48 cm	10 cm	Non-Flowering
103	Persian Silk (B)	13	Tree	457-1080 cm	72-165 cm	Flowering
104	Giricidia sepium	15	Tree	579-1060 cm	25-157 cm	Flowering
105	Persian Silk (S)	80	Shrub	120-180 cm	4-5 cm	Flowering

106	Malvaceae	65	Shrub	30-195 cm	3-7 cm	Flowering
107	Eucalyptus Dausonii	3	Tree	609-1220 cm	120-165 cm	Flowering
108	Indian almond	23	Tree	450-1097 cm	17-165 cm	Flowering
109	Teak	27	Tree	914-2550 cm	31-143 cm	Flowering
110	Eucalyptus Neglecta	21	Tree	610-1080 cm	32-135 cm	Flowering
111	White goosefoot	53	Shrub	93-120 cm	4-7 cm	Flowering
112	Earleaf acacia	5	Tree	721-1023 cm	51-85 cm	Flowering
113	True cinnamon	9	Tree	460-1225 cm	43-114 cm	Flowering
114	Indian head ginger	1	Shrub	50 cm	4 cm	Flowering
115	Piscidia tiscipula	2	Tree	1220-1382 cm	48-65 cm	Flowering
116	Terrestrial flora	1	Tree	195-213 cm	15 cm	Non-Flowering
117	Lanzunes	5	Tree	1220-1451 cm	45-65 cm	Flowering
118	Noni	3	Shrub	195-213 cm	10-13 cm	Flowering
119	Paper mulberry	17	Shrub	20-45 cm	6-13 cm	Flowering
120	Ashok	19	Tree	243-1250 cm	17-63 cm	Flowering
121	Urera	7	Tree	780-1400 cm	32-92 cm	Flowering
122	Puuroma guanepsis	1	Tree	1380 cm	81 cm	Flowering
123	Mexican devil	53	Shrub	30-81 cm	2-6 cm	Flowering
124	Casuarina	7	Tree	609-975 cm	32-187 cm	Non-Flowering
125	Ficus elastica	4	Tree	600-960 cm	12-137 cm	Flowering
126	Barren wart	15	Shrub	190-240 cm	10-15 cm	Flowering
127	Lemon	5	Shrub	200-296 cm	5-20 cm	Flowering
128	Thuja	6	Shrub	20-30 cm	2-5 cm	Non-Flowering
129	Moses-in-the-cradle	30	Shrub	28-32 cm	3-5 cm	Non-Flowering
130	Cruton	9	Shrub	40-50 cm	5-8 cm	Non-Flowering
131	Elephantopus scaber	30	Shrub	3-6 cm	2-5 cm	Non-Flowering
132	Ficus Alli	4	Tree	450-800 cm	48-73 cm	Flowering
133	Agathis bornensis	1	Tree	450 cm	65 cm	Flowering
134	Bakula	1	Tree	620 cm	78 cm	Flowering
135	Acalypha Indica	15	Shrub	30-40 cm	2-5 cm	Flowering
Total No . Of Plants		2243				

Table-2

Class room	Total Lights	Light Type	Fan	AC	CCTV	Bulb Holders	PC
Room - 1 (Economics)	2	Bar -1 Led -1	4	-	1		
Room - H (Chemistry)	2	Bar -1 Led -1	4	-	1		
Room - G (Mathematics)	2	Bar -1 Led -1	4	-	1		
Room - F	2	Bar -1 Led -1	4	-	1		
Room - E	1	LED	2	-	-	1	
Hall - 8 (Physics)	2	LED-2	4	-	1		
Hall - 9	2	LED-2	4	-	1		
Hall - 10	2	LED-2	4	-	1		
Hall - 11 (Botany)	2	LED-2	4	-	1		
Hall - 7 (Computer Lab)	2	LED-2	2	1	1	1	12
Toilet	9	LED-8 Bar - 1	Exhaust - 1	-	-	-	
Outer	21	LED			4		
Infront of Principal Office	1	LED	1		1		
Hall - B (IQAC ROOM)	5	LED-4 Panel LED-1	5	2	1		
Outside Hall- B	1	LED	4		1		
Staff Common Room	1	LED	4		1		
Outside Staff Common Room	1	LED					
Hall-5 (Dept. of History)	2	CFL-1 LED- 1	4		1		
Hall-4 (Dept. of Commerce)	3	LED	5		1	4	
Hall-3	6	Barlight	7		1		

Room D1	3	CFL-1 2	LED-	1		3		
Outside D1	2	CFL-1 1	LED-	1		3		
Outside D9						1	2	
Hall D9	13	Bar-2 11	LED-	8	3	1		
Hall D8 (Dept. of Education)	4	Bar-2 2	LED-	4			1	
Outside D8							1	
Hall D7 (Dept. of Odia)	4	Bar-2 2	LED-	4		1	2	
Outside D7							1	
Hall D6 (Dept. of English)	3	Bar-2 1	LED-	3		1	2	
Outside Hall D6	1	LED						
Staff Washroom	1	LED						
D5 (Chemistry Lab)	4	LED	Wall fan-1	1	1	1		
D4 (Botany Lab)	4	LED	5	1	1	4		
Outside D3	1	100 W						
Seminar Hall	8	LED	Wall fan-10	3	1			
Outside Seminar Hall	1	LED			1			
Degree Office	2	LED	2	1	2			
CAF Counter	3	LED	2	1	1			
Outside Degree Office	2	LED-1 Barlight -1			2			
Principal Room	11	LED - 9 Panel LED -2	Wall fan-1 Stand Fan-1	1	1			PC-2 LED-1

SCC Hall	35	LED-16 Panel LED-8 Spotlight-2 Hallogen LED 2 Palco-5 Laser-1	Wall fan-15	Central AC-4 AC-1	2		Projector-1
Outside SCC hall	10	LED			1		
Accounts Office	2	LED-2	Fan-1		1	1	

CALCULATION

AND

CONCLUSION

OXYGEN PRODUCTION

- 1 PLANT = 310 lt/day
- 1 PLANT = 2170 lt/week
- 2243 PLANT = 48,67,000 lt/week

OXYGEN CONSUMPTION

- 1 PERSON CONSUMES OXYGEN IN ONE WEEK = 25 lt
- 1355 PERSONS CONSUMED OXYGEN IN ONE WEEK = 33,875 lt

CARBON DIOXIDE PRODUCTION

- 1 kW produces 870 gm. of CO₂

➤ So, 1 W produces 0.87 gm. of CO₂

Types of Electronic Device	Amount of Electricity produced	1 device Producing CO₂	Total No. of Devices Present	Amount of CO₂ produced in 1 hr	Working Hour of The Electronic Device	Total Amount of CO₂ Produced
LED	9 W	$0.87 \times 9 = 7.83$ gm.	125	$7.83 \times 125 = 978.75$ gm.	10 hrs.	$978.75 \times 10 = 9,787.50$ gm./day
CFL	140 W	$0.87 \times 14 = 12.18$ gm.	3	$12.18 \times 3 = 36.54$ gm.	10 hrs.	$36.54 \times 10 = 365.4$ gm./day
FAN	320 W	$0.87 \times 320 = 278.40$ gm.	126	$278.40 \times 126 = 35,078.40$ gm.	10 hrs.	$35,078.40 \times 10 = 3,50,784$ gm./day
AC	1000 W	$0.87 \times 1000 = 870$ gm.	19	$870 \times 19 = 16,530$ gm.	5 hrs.	$16,530 \times 5 = 82,650$ gm./day
COMPUTER	200 W	$0.87 \times 200 = 174$ gm.	15	$174 \times 15 = 2,610$ gm.	10 hrs.	$2,610 \times 10 = 26,100$ gm./day
BARLIGHT	40 W	$0.87 \times 40 = 34.80$ gm.	15	$34.80 \times 15 = 522$ gm.	10 hrs.	$522 \times 10 = 5220$ gm./day

CCTV	50 W	$0.87 \times 50 =$ 43.50 gm.	44	$43.50 \times 44 =$ 1,914 gm.	5 hrs.	$1,914 \times 5 =$ 9,570 gm./day
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- A human produces the same amount of CO₂ as it intakes O₂.
- So, 1355 persons produces 33,875 lt. of CO₂ in a week.
- 1 Vehicle produces 100 gm. Of CO₂ in 1 hour. But in campus vehicle usage is of an average of 30 minutes. i.e., 1 vehicle produces 50 gm. Of CO₂.
- So, Average of 100 vehicles produces 5,000 gm. Of CO₂ per day.
- So weekly the Vehicles in campus produces 35,000 gm. Of CO₂.
- Weekly the electronic devices produces 33, 91,332 gm. of CO₂.
- So weekly from the campus we get both from vehicles and electronic gadgets are 34, 26, 332 gm. of CO₂.
- Converting it into liters, we get 3,426.33 lt. of CO₂.
- As mentioned above, the humans present in the campus produce 33,875 lt. of CO₂.
- So, adding both of them we get 37,301.33 lt. of CO₂, which is approximately **38,000 lt.** of CO₂.
- **Amount of Oxygen released = 48,67,000 lt.**
- **Amount of Carbon Dioxide released = 38,000 lt.**
- Comparing to the amount of O₂ produced and amount of CO₂ produced we conclude that the amount of O₂ is very large as compared to the amount of CO₂ produced.
- This concludes that our Campus environment is a fully green environment.



Green Footprint



Certificate of Recognition

We are glad to issue

Clean & Green Campus Award 2020

to

RAJA M D DEGREE COLLEGE, PATIA, BBSR

On 8th February 2020

P. Das.

Priyadarsini Das
Convener, Green Footprint

Prajna Jandey

Prajna Jandey
Coordinator, Green Campus Programme

K. K. Dash

Prof. Kamala Kanta Dash
Director, Climate & Sustainability Centre, SSU



Green Footprint

Green Footprint

A people's initiative for a greener Planet

176, Twin City Green Homes & Villas, Uttampur, Cuttack
Email: greenfootprint.odisha@gmail.com

4th Feb 2020

To
The Principal
Raja M D Degree College,
Patia, Bhubaneswar

Sub: Certificate of Recognition for Clean & Green Campus

Sir,

On visit to you campus over the last couple of years you have extended a great deal of support to us. Our volunteers along with your students, staff and faculty have taken many initiatives be it plantation, putting birds' nests, keeping drinking water for animals & birds or about general cleanliness of the campus in these years. We are extremely happy to inform you that our network of organization under the banner of 'Green Footprint' recognizes your endeavor in localizing Sustainable Goals while keeping the campus clean and green. In this regard a team of experts from the network have selected your institution as the Clean and Green Campus for the year 2020. We will be coming in person to handover the certificate on 8th February 2020.

I shall appreciate if you could remain present on 8th February afternoon at your office for a small discussion and handing over the certificate to your goodself.

Looking forward to hear from you.

Best Regards,

P. Das

Priyadarsini Das
Convener, Green Footprint