Green Audit: A Case Study of Saifee Golden Jubilee Quaderia College, Burhanpur, M.P., India

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ABSTRACT

Green Audit is a requirement of "NAAC" committee to the college. The concept of Green audit, industries are using it as a management tool to evaluate the environmental standards, industries can perform better and better for the sustainable development of the organization. The Experiments on the nature by avoiding natural rules, this can be one major reason behind that is green Audit. The term 'Green' means eco- friendly or not damaging the environment. Green Accounting can be defined as systematic identification, quantification, recording, reporting & analysis of components of ecological diversity & expressing the same in financial or social terms drivers of green audit, future scope, benefits and advantages are necessary to understand, A total of 267 species (Angiosperms-256, Gymnosperms-11) and 56 families (Dicot-48, Monocot-08), have been reported from the study area. As part of green audit of study area, we carried out the environmental monitoring of campus includes waste management. (Vermicomposting, Bio-waste management), greenhouse effect, aquarium, mushroom culture water conservation, tree plantation, paperless work, vegetative propagation, butterfly garden, ventilation paperless work system and mapping of Biodiversity. Noise level in the campus is well within the limit i.e. below 50 dB at day time. This may lead to the prosper future in context of Green Campus & thus sustainable environment and committee development. Further we hope, this will boost the new generation to take care of environment and propagate these views for many generations to come.

Keyword: NAAC, Eco-friendly, sustainable Development, Ecological diversity.

I INTRODUCTION

The green audit is conducted to improve the environmental conditions of the college as protection of environment is a prime necessity in the present era. It is meant for ensuring ecological balance and bio-proliferation. The objective of carrying out green audit in the college is to create awareness among the students as to real concerns of environment. It helps as an indicator of the deterioration in environmental conditions and provides a fillip to the programs and policies of the institute. The college is established in the year 1962 and is affiliated to the DAVV Indore, MP, India. It is situated in the salubrious bank of river Tapti and covers an area of 6 $^{1/2}$ % acres of which 60% area is fully under green umbrella and 40 % is partially covered with green trees and plants.

In scenario people are not caring of nature, they are directly or indirectly damaging the environment and it causes problems like: global warning, difficulties in maintaining ozone layers, air pollution, water pollution etc. Green Audit in the most efficient and ecological war to solve such a environment problem. For protecting the nature as a human being we have to show our sense of humor towards the mother earth. The Green Audit of is requirement of NAAC committee to the college. A report on green audit has been prepared by department of Botany, S.G.J. Quaderia College, Burhanpur, MP, India. This college was established in 22 July, 1962 and accredited with Grade 'B' by NAAC, Bangalore.

II REVIEW OF LITERATURE

In 2008, Adeniji is the first who primarily concerned with environment audit of the companies to the growing importance of green issues. **In 2008, Porter, Simon and Hatchery** is the first who clearly mention exactly what is the green audit? And after his explanation about the green audit this concept "Green audit" as "Environment management system" (EMS) that is continuous increase in environment and communication of the result of the EMS activity with organizations directors.

III MATERIALS AND METHODOLOGY

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of documentation, interviewing key persons and data analysis, measurement and recommendations. So this study is conceptual study. The methodology is adopted for this paper by collecting the information from secondary sources, personal views and opinion also included in this study. Qualitative and quantitative analysis of flora and fauna was done by biostatical central tendencies and survey methodology recorded species were identified with the help of expert, local floras and using standard literature & other sources.

IV OBSERVATION ACTUAL CASE STUDY

(a) Name of College- S.G.J. Quaderia College, Burhanpur, MP, India (Near the historical Shahi Qila)

S. No.	Name and area of the unit	Total area (in Sq. Ft.)
1.	Total Campus area	25981
2.	Built up area of the building	3418
3.	Built up area of administrative Block (Office)	360
4.	Room E Class	400
5.	Botany Lab area	1600
6.	Computer Dept. + Lecture theater + chemistry Dept.	4500
7.	Microbiology + Biotechnology	2400
8.	Zoology lab	3125
9.	Physics Lab	560
10.	Library (Varandah front back)	2125
11.	Class Room (with Varandah)	2240
12.	Staff Room	360
13.	Girls Common Room	400
14.	NAAC office	360
15.	Secretary office	450
16.	Principal office	450
17.	Toilet Block 1	105
	Toilet Block 2	110
	Toilet Block 3	126
18.	Principal	450
19.	NSS room	400
20.	Hall	2625
21.	Old Building	2100
22.	Home Science Dept.	3000

(b) Water Consumption

S. No	Water used for	April 2017 to March 2018
1.	Domestic Purpose	5000 Lit / day
2.	Gardening	15000 Lit / day
3.	Laboratory Purpose	**MMMMM / DAY**

(c) Electricity consumption

Electricity consumption	Uses
Per day	680 Unit kwH
Per Month	2147 Unit kwH
Per Year	25764 Unit kwH

(e) Solid Wastes

S.No	Source of Waste	Total Quality	Method of Disposal
1	Solid waste from trees dropping & Lawn	10 kg/ day	Vermi composting + Organic Manure
2.	Solid waste from Chemistry Botany and Zoology lab	04 kg/ day	
3.	Plastic waste	0.2 kg/ day	

(f) E- Waste Management

The total No. of Computers in the institute – 52
Printers-06
Xerox machine-02

(g) Plantation Awareness Program:

The institute has organized "Tree Plantation program" at college campus and surrounding village (Chandni) through

student Red Cross & NSS unit. The plantation program includes Plantation of various types of family (family- 56, Species angiosperms -256 and species Gymnosperm-11 total 267) and also maintaining green house, Botanical garden including butterfly garden. This program helps in maintaining "eco-friendly" environment as well as provides pure oxygen within the institute.

S.No	Biodiversity Local Name	Total No of Plants			Popular Name Famous Name	Botanical Name	Family
		2015-16	2016-17	2017-18			
Small Size Trees							
1	Amaltas	01	02	02	Amaltas	Cassia fistula	Caesalpinoideae
2	Arandi	01	01	01	Arandi	Ricinus communis	Euphorbiaceae
Medium Size Tress							
3	Babool	01	02	02	Babool	Acacia arobica	Mimosoideae
Large Size Tress							
4	Imli	01	01	02	Imli	Tamarindus Indica	Caesalpinoideae
5	Casurina	19	20	21	Casurina	Casurina equisitifolia	Casurinaceae
6	Jamun	01	01	01	Jamun	Syzygium Cuminii	Myrtaceae
Bushes							
7	Aak	01	02	02	Aak	Calotropis Procera	Aselepiadaceae
8	Karonda(Kakronda)	01	01	03	Karonda	Carissa Spinarum	Apocynaeeae
Undergrowth							
9	Ashwgandha	03	05	06	Ashwgandha	Withania Somnifera	Solanaeae
10	Lazni	04	10	12	Lazwanti	Mimosa Pudica	Mimosoidae
11	satawari	01	01	01	Satawar	Asparagus recemosus	Liliaceae
12	Gudhal	01	01	01	Gudhal	Hibiscus rosa, Synansis L.sp.pl.	Malvaceae
Small Bushes							
13	Kala Datura	01	04	06	Datura	Motel	Solanaceae
14	Madaar Parasite	02	04	07	Aak	Calotropis Procera	Aselepiadaeeae
15	Amarbel Herbs	01	01	02	Amarbel	Cuseuta reflexa	Convolvulaceae
16	Gokru	05	10	15	Gokru	Tribulus terresteris terresteris	Zygophyllaceae
17	Tulsi	03	10	19	Tulsi	Ocimum Sanctum	Labiatae
18	Bhata (Brinjal)	01	05	08	Began	Solanum Melongena	Solanaceae
19	Safed Musli	00	05	01	Safed Musli	Chlorophytum tuberosum	Orchidaceae
Climbers							
20	Kankarwa	01	04	05	Kankarwa	Ditoria turnata	Papilionaeeae
Bamboo							
21	Bamboo	00	01	01	Bamboo	Dendrocalamus strictus	Poaceae
Grass							
21	Duba	00	00	08	Doob	Cynodon daetylon	Graminae(poaceae)
22	Common Ghass	00	00	03	Ghass	Pennicum Indicum	Poaceae
Small Size Tress							
23	Gul Mohar	02	07	09	Gul Mohar	Delonix indicum	Caesalpinoideae

24	Nimbu (citrno)	01	03	04	Neebu	Citrus Lemonia	Rutaceae
25	Nagfani	01	04	05	Nagfani	Opuntia Dillenii	Cactaceae
26	Baer (Zizipus)	01	01	01	Ber	Zizyphus moureitiana	Rhanaceae
27	Mithi Neem	01	05	07	Mithi neem	Murraya Koenigii	Miliaceae
28	Willayati Babool	01	01	01	Willayati Babool	Parkinsonia Aculeota	Caesalpinoideae
29	Willayati Imli	01	01	02	Willayati Imli	Pithecolobium dulce	Papilionaceae
30	Shehtoot	01	01	01	Shehtoot	Morus alba	Moraceae
31	Sejha	01	01	02	Munga	Moringa elleffera	Moringaaceae
32	Sitafal	03	10	16	Sitafal	Annona squamosa	Annonaceae
33	Selfund	01	01	05	Nivarang	Euphorbia nivulia	Euphorbiaeeae
Medium Size Trees							
34	Sheeshum	07	08	10	Sheeshum	Dalbegia Latifolia	Papilionateae
35	Deshi Badam	03	06	08	Deshi Badam	Terminala catappa	Combretaceae
36	Neem	10	20	25	Neem	Azadirachta indica	Meliaeeae
37	Neelgiri	01	01	02	Neelgiri	Eucalyptus teretecornis	Myrtaeeae
38	Peepal	15	20	25	Peepal	Ficus religiosa	Moraceae
39	Badh	01	01	02	Bargad	Ficus bengalensis	Moraceae
40	Saggon	01	01	01	Sagoon	Teetona Grandis	Verbenaceae
Medicinal Plants							
41	Safed Musli	04	05	01	Safed Musli	Chlorophytum tuberosum	Amonillidaeeae
42	Jangli Tulsi	05	10	15	Jangli Tulsi	Ocimum basilicum	Labiateae
43	Bhat Kattiya	03	04	05	Bhat Kattiya	Solanum zanthoearpum	Solanaeeae
44	Aadha Sisi	03	04	10	Gokhru	Tribulus terrestris	zygophyllaceae
45	Bhindi	04	10	11	Okra	Abelmosecus eseulentus	Malvaceae
46	Pudina	09	10	25	Mentha	Mentha sp.	Lamiaceae
47	Rose	04	05	45	Gulab	Rosa damascena	Rosaceae
48	Pyaz	01	10	15	Onion	Allium Sepa	Liliaeeae
49	Pili Sarsoo	03	05	10	Yellow mustard	Brassica campestris	Cruciferae
50	Kewra	01	01	01	Kewra	Pandanus odoratissimus	Pandanaceae
51	Ajwain	01	02	05	Ajwain	Prachyspermum ammi	Apiaceae
52	Pan	19	20	25	Betel	Piper betle	Piperaceae
53	Euphorbia	02	03	15	Euphorbia	Euphorbia hirta	Euphorbiaceae
54	Hatjod	04	06	02	Hatjod	Cissus quadrangularis	Vitaceae
55	American chili	19	20	10	American Mirch	Capsicum annuum	Solanaceae
56	Patthar chatta	03	04	05	Patthar chatta	Bryophyllum pinnatum	Crassulaceae
57	Insulin	01	02	02	Insulin	Chamauostus cuspidatus	Costaceae
58	American aloe	08	09	10	American aloe	Agave Americana	Agavaceae
59	Safed siris	01	01	01	Safed siris	Albizia procera	Mimosaceae
60	Boogan bel	08	10	11	Boogan bel	Bougainvillea glabra	Nyctaginaceae

61	Ber	01	01	01	Ber	Ziziphus mauritiana	Rhamnaceae
62	Lahsun	08	20	25	Lahsun	Allium sativum	Alliaceae
63	Chiku	01	01	01	Chiku	Manilkara zapota	Sapotaceae
64	Railway creeper	01	01	02	Railway creeper	Ipomea cairica	Convolvulaceae
65	Coat buttons	08	20	22	Coat buttons	Tridex procumbens	Asteraceae
66	Giloy	03	05	06	Giloy	Tinospora cordifolia	Menispermaceae
67	Salvadora	01	01	01	Salvadora	Salvadora persica	Salvadoraceae
68	Ashoka	04	05	08	Ashoka	Saraca asoca	caesalpiniaceae
Ornamental Plants							
69	Bottle Brush	01	01	01	Bottle brush	Callistemon sp.	Myrtaeeae
70	Firebush	02	03	04	Firebush	Hamelia Plants Jacqenum pl.	Rubiaceae
71	Sadabahar	05	10	11	Sadasuhagan	Vinka rosea	Apoeynaeeae
72	Euphorbia	02	03	05	Euphorbia	Euphorbia pulchrryma	Euphorbiaeeae
73	Kaner	08	13	13	Kaner	Thevelia peruviana(pers)schum	Apocynaeeae
74	Kamal	02	04	06	Lotus	Nymphia sp.	Nymphiceae
75	Genda	08	10	12	Genda	Tagetes ereetal	Asteraceae
76	Petunia	08	10	15	Petunia	Petunia sp.	Solanaeeae
77	Kagaz ke phool	09	10	18	Kagaz ke phool	Polygonum sp.	Polygoniaceae
78	Mehndi	03	04	04	Mehndi Heena	Lewsonia inermus(L.)	Lythraceae
Family							
79	Satyanashi	07	10	10	Pilicatai	Arqimone mexsikiana	Papaveraceae
80	Makoli	06	10	10	Makoli	Solanum nigram	Solanaceae
81	Dhaniya	01	02	03	Dhaniya	Coriandrumsp.	Umbelliferae
82	Peeli Kaner	09	13	14	Peeli Kaner	Casebella thevetia (L.)	Lippid
83	Palm	02	03	03	Palm	Chamaerops humilis L.	Areceaceae
84	Euphorbia	02	03	05	Euphorbia	Euphorbia hirta	Euphorbiaceae
85	Papita	04	06	07	Papaya	Carica Papaya	Caricaceae
86	Touch me not Chuimui	03	05	06	Lajwanti	Mimosa pudica Linn.	Mimosoideae
87	Khatti Buttti	04	05	06	Khatti Butti	Oxalis Achalypha indica	Euphorbiaceae
88	Chaullai	06	10	11	Chaulai	Amaranthus	Amaranthaeeae
89	Sitab	03	04	15	Sitab	Ruta graviens	Rutaeeae
90	Andosa	04	05	06	Aadusa	Adhatoda vasica	Aconthaeeae
91	Champa	00	01	01	Champa	Michelia champaea Linn	Magnoliaceae
92	Mango	01	01	02	Aam	Mangifera indica L.	Myrtaeeae
96	Amrood	01	02	02	Jaam	Psidium gujava L.	Anacardiaceae
97	Amla	01	02	02	Amla	Phyllanthus fraternas	Enphorbiaeeae
98	Beel	01	01	02	Beel	Aegle marmelos (L.)	Rutaeeae
99	Agave	23	04	06	Agave	Agave amiricana	Agavaceae
100	Bottlepalm	19	20	21	Bottlepalm	Hyophorbe lagenicaulis	Arecaceae
101	Gwarpatha	04	10	10	Gwarpatha	Aloe vera L. Burm L.	Liliaceae
102	Gulmohar	04	07	08	Gulmohar	Delonix regia	Caesalpinoideae
103	Nirgundi	00	01	01	Nirgundi	Vitex- migundol	Verbenaeeae
104	Croton	02	03	03	Croton	Codicum Varigatum(L.)BLBijp.	Euphorbiaeeae
105	Kaner	02	03	04	Kanher	Nerium indicum Nill	Apocynaeeae
106	Vidhya	10	20	22	Thuja(Morpan	Platy eladus orientalis(L.)	Cupressaceae

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107	Gulab	02	02	03	Gulab	Rosa indica L.sp.	Rosaceaae
108	Gulab	00	01	02	Gulab	Rosa domoscena Mill.	Rosaceae
109	Gulab	00	01	03	Gulab	Rosa multiflora thunb.	Rosaceae
110	Yellow rain lily	09	20	23	Zephyranthes	citring baker.bot.	Amaryllidaceae
111	Madhumati	03	04	06	Gelphimia	Gracilis (Bart c)	Malphigaceae
112	Giant	02	02	02	False agave	Furcraea gracilis(Barti)	Malphigaceae
113	Kelly	01	02	04	Kardal	Canna indica L.sp.pl.	Cannaceae
114	Sultan	04	05	06	Sultan	Aealypha hispida Jpg.	Euphorbiaceae
115	Kamal	02	04	06	Kamal ka phool	Nymphaea nouchali burm	Nympheae
116	Hydrilla	08	10	11	Hydrilla	Hydrilla Verticillata(L.f.)Royle	Hydrocharitaceae
117	Hydrilla	01	02	03	Hydrilla	Ipomoea pes-tigridis L.	Convolvulaceae
118	Hydrilla	00	02	04	Hydrilla	Ageratum Conyzoides L	Compositae
119	Hydrilla	00	02	06	Hydrilla	Boerhavia repens L.var.diffusa(L.)	Moorthy
120	Dawal	01	02	04	Anjan Lokariya	Tephrosia purpurea(L.) Pres.	Liguminosae
Gymnosperm							
121	Cycus	01	02	05	Cycus	Cycus revolute	Cycadaceae
122	Cycus	01	02	06	Cycus	Cycus circinalis	Cycadaceae

Statistical analysis of Biodiversity

S. No.	Groups	Families	Species
1.	Angiosperms -Dicot	48	256
	Angiosperms -Monocot	08	
2.	Gymnosprm	-	11
Grand Total		**56**	**267**

Summary (Biodiversity of plants)

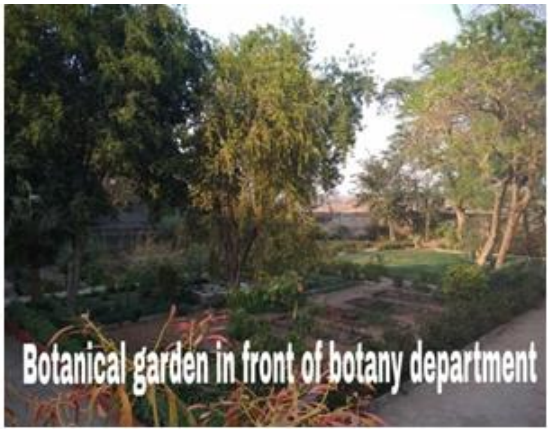
Small size trees	-	24	Medium size trees	-	55
Large size trees	-	24	Bushes	-	05
Undergrowth	-	20	Small Bushes	-	58
Parasites	-	01	Herbs	-	04
Climber	-	06	Bamboos	-	01
Grass	-	11	Medicinal	-	27
Ornamental	-	20	Gymnosperms	-	11
Total	**:**	**106**		**:**	**161**

Grand total: 106+161= 267

Elevation of Main College Building

Infrastructure and Greenbelt Area

TYPES OF ETHNOMEDICINAL PLANTS



Types of Ethnotaxonomical Plants

Types of Divergent Plants

Butterfly Garden (Indicator of Environment)

(h) Vermiculture composting Culture:

The institute is has started vermiculture composting culture in campus during 2017-18 on 3×8 sq. meter land. The main purpose of this is to reduce disposable waste in the college campus and after complete process of vermicomposting it is used as manure and awareness in students & farmers. The main benefits of the process are to reduce the waste in the environment and also it is cost savings process.

a. Aquarium

A aquarium is a transparent container in which aquatic animals are kept along with aquatic plants, rocks, gravels, artificial decorative etc. Simulating natural environment. It enables the students to have a close view of the fishes of different varieties. Which caters to our objective of providing practical knowledge along with theoretical knowledge to the students and brings students closes to natural environment.

(i) Mushroom culture:

We are also cultivating mushroom of oyster variety.

(j) Noise level limits in the campus:

As a part of green audit of campus, through one day seminar & workshop on "NOISE

POLLUTION and IT'S EFFECT ON HUMAN HEALTH ", the students were asked to check the noise level in the campus by using sound level meter and they observed that the noise level in the campus is well within the limit i.e. below 50 dB at day time.

(k) Environment awareness program:
While maintain the environment awareness program in the campus it is compulsory subject to all second year student which is irrespective to particular branches (In foundation course)

(l) Awareness of carbon consumption:
In the college campus almost 90% of students are using bicycle. Due to awareness program in the campus air quality within it is non-polluted.

V RESULT AND DISCUSSION

The environmental awareness initiatives are substantial. Paperless work system and vermicomposting practices are noteworthy. Besides, environmental awareness programs initiated by the administration shows how the campus is giving green. As part of green audit of campus, we carried out the environmental monitoring of campus includes noise level, ventilation and indoor air quality of the class room. It was observed that illumination and ventilation is adequate considering natural light and air velocity present.

VI CONCLUSION

Green audit is the most efficient & ecological way to solve such a environmental problem. It is necessary to conduct a green audit in college campus because student aware of the green audit, its advantages to save the planet & they become good citizen of our country. Further we hope this will boost the new generation to take care of environment and propagate these views for many generations to come.

REFERENCES

[1] Adeniji, A.A. (2008) Audit and Assurance services, Lagos: Value Analyst concept of Green Audit.

[2] Anandraj, Sahu (2012), "Green Audit: How Practically facing of changing business perspective towards nature."