



GREEN AUDIT REPORT (2021-22)

To
**K.A.A.N.M.S. Art's, Commerce and
Science College Satana Nashik-423301.**

Prepared by

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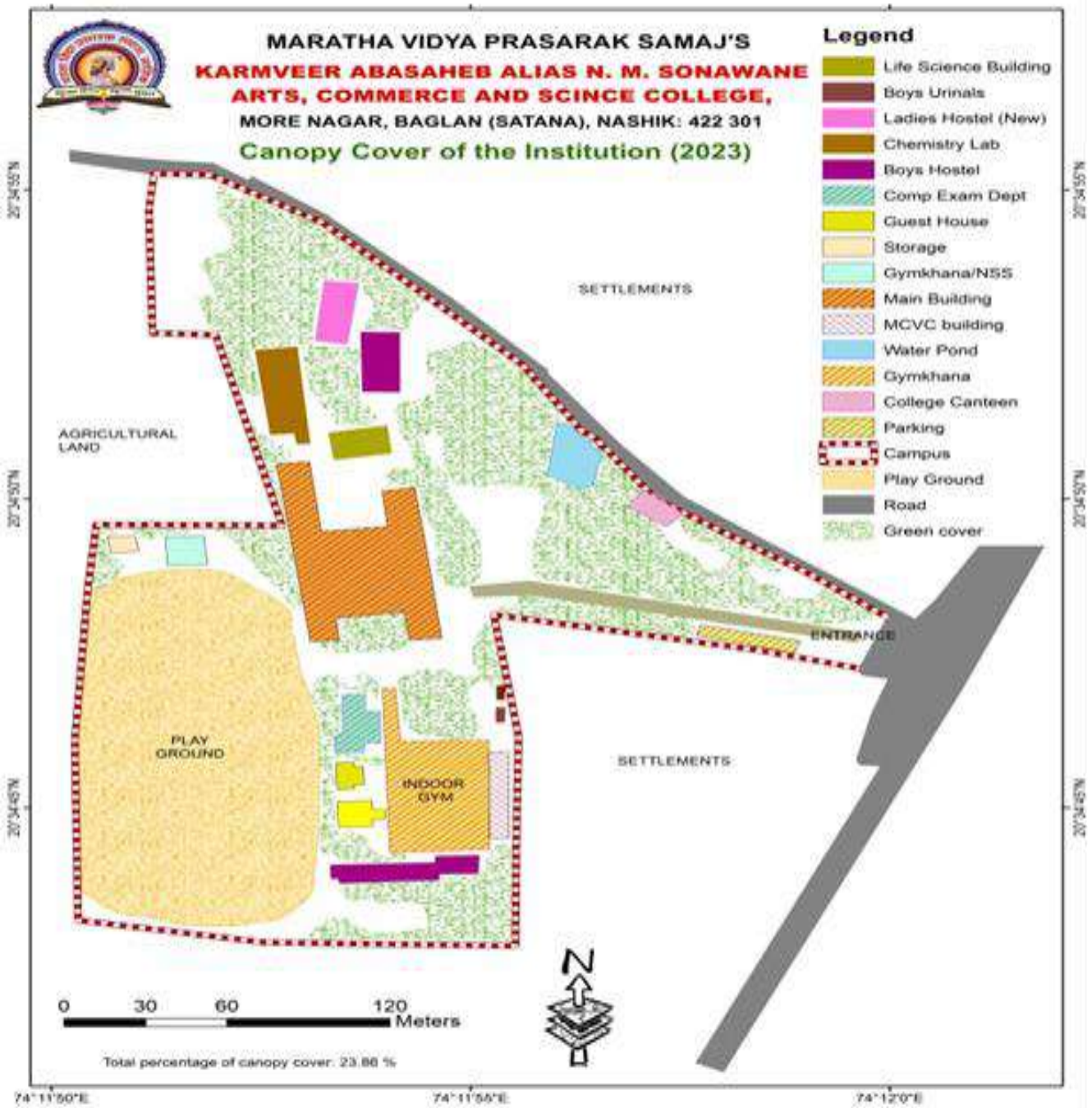
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College Layout





College Gate Entry



Executive Summary

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institute which will lead for sustainable development.

The K.A.A.N.M.S. Art's, Commerce and Science College Satana Nashik-423301 is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends. Being a premier institution of higher learning, the college has initiated 'The Green Campus' program that actively promote the various projects for the environment protection and sustainability.

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. The methodology include: preparation and filling up of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons, data analysis, measurements and recommendations. It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Waste water management, Rain water harvesting, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit are to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student's health and learning college operational costs and the environment. The criteria, methods and recommendations used in the audit are based on the identified risks.

1. Introduction

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyze environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth by carrying out Green Audit.

1.1 About the College

Karmveer Abasaheb Alias N. M. Sonawane Arts, Commerce and Science College, Satana was established in 1967 and reaccredited with Grade 'A' by NAAC, Bangalore, and awarded "Best college of rural area" award by Savitribai Phule Pune University, Pune. Satana college has an adequate academic and physical infrastructure catering to the 20 subjects' classes of under graduate classes and has regular PG courses in 12 Departments Chemistry, Microbiology, Botany, Zoology, Marathi, Hindi, Geography, Economics, Politics, English, History, Commerce with new started vocational courses namely Horticulture and Agriculture, Beauty and Wellness, BBA. Total area of the college main campus is 18 acres of which 70 percent is covered by herbs, shrubs and trees, including valuable medicinal flora. The plant has been systematically identified by the green audit committee, and classified by the system of Bentham and Hooker. There are more than 538 plant species were audited. Economic and ecological importance of plants are studied, diseases of plants are also studied. Tree census of campus was

carried out Birds, insects, fungi and overall the biodiversity of the campus is studied. Along with topographic study of the campus measurement of the campus is also taken. Green spots of the campus identified, irrigation facility, water resources studied and evaluated, vehicle survey and carbon foot print were calculated. Tree plantation and environmental awareness programmes of college was also evaluated.

The green audit report has been discussed with environmental experts of Pollution Control department, Nashik and District Forest Officer, Nashik, with suggestions to increase greenery in campus. Extra efforts have been taken by the college to create environment consciousness amongst students. Green audit is the self-evaluation of any institute. Our initiative takes the initiative to evaluate ourselves, how much we are environmentally fit?8 What kind of changes should bring among us, an institute. We must flow the rule of nature for the maintenance of environment clan and healthy. In the present audit most of the environmental aspects have been covered. Trees, plants, shrubs, climbers, crop plants, ornamental plants, medicinal plants of the campus counted and conserved. They are classified following Bentham and Hookers system of classification. Their ecological and economic importance is also studied. Along with it the fungal biodiversity of the campus also studied. The campus is a habitat Butterflies, beetles, of the campus were studied. Topography of the campus was studied by taking measurements by scientific methods. While studying the health index of the trees and plants it was found that most of the plants are healthy and free from diseases. Environmental awareness programmes and outside the campus such as tree plantation are also discussed in the audit. Lastly the findings and recommendations regarding audit are also given. The present audit report finds out areas of strengths and weaknesses in environmental management within the institute. Finding of green audit report showed that institute should take care of

local environment for the betterment of future. College has already taken some steps like plantation of local and medicinal plants, arranges special programmes by inviting the eminent personalities for environmental consciousness of staff as well as students. Under the guidance of our Principal, Dr. Dilip Dhondge, this is the first attempt to conduct green audit of our college campus. Very truly, the wellknown scientist Albert Einstein said that, "Look deep into nature, and then you will understand everything better" This is very little attempt to look into nature around us, I hope the present audit report will be helpful for evaluating yourself.

VISION:

To bring our college on par with the best ones in the world by imparting quality education based on values.

MISSION:

- To educate youth, especially from rural part of India, in mind, body & spirit.
- To ensure the social, emotional, physical and intellectual development of each student.
- To Provide world class education, research facility, caring and creative social environment.
- To introduce innovative techniques, varied instructional strategies and interdisciplinary communication.

2. Objectives of the Study

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

- To introduce and make students aware of real concerns of environment and its sustainability.

- To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections require high cost.
- To bring out a status report on environmental compliance.

3. 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 the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarise the present status of environment management in the campus:

- Green area management
- Environment Auditing
- Water management
- Energy conservation
- Waste management
- E-waste management

4. Observations and Recommendations

4.1 Green Area

This includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced, and reviewed using various environmental awareness programmes.

Totally eleven green spots are found in the maintained by various plant species. Botanical garden is prepared very scientific manner, educationally important all plants are grown there. Different buildings developed their own greenery to maintain eco-friendly environment in the campus.

The Botanical Garden of the college is rich with various important herbs, shrub, climbers and trees. In the water pond of the Botanical Garden plant species like *Nimphyha nauchati*, *Hydrilla*, *Chara*, *Spirogyra*, *Lotus* are present and on the front side of plant nursery were number of plant cultivated such as *Mango*, *Sapota*, *Neem*, *Banana*, *Papaya*, *Guava*, *Applebor*, *Bottle brush*, *Aloe vera*, *Custard Apple*, *Tulas*, *Marigold*, *Plumeria*, *Rose*, *Cycas*, *Santlum album*, *Cesalpinia pulchirima*, *Grilicidia superba*, *Tamarandus*, *Karanj*, *Gulmohor*, *Bahava*, *Awala*, *Ratrani*, *Pomogranate*, *Ixora*, *Adulsa*, *Croton*, *Eucalyptus*, *Fern*, *Nerium*, *Tridax*, *Coconut*, *Palm*, and other ornamental plants are also present

Green Area of College Campus

a) Observations

In the category of tree 1225 plants are found in the campus those having 109 different species. Which are having medicinal, religious, educational and environmental importance, which making the campus rich heritage.

In the category of shrubs 13 different types of shrubs are found having the number of 77 different species having ornamental, medicinal and educational importance which increases the beauty of campus. Some cultivated or crop species of the region are also present in the campus four cultivated plants are planted in campus having 45 different species of these plants, which having educational importance in the campus. Three climbers are also found in botanical garden of the campus, which are having 7 different species. Few ornamental plants are also present in the college present having 10 different species, which add on the aesthetic value of the campus.

Tree plantation was done under various schemes near the main entry gate the new area developed is of approximately 1200 Sq.m area. The college has planted variety of plants in that area regular nursing and care taking activities were routinely performed such as regular irrigation facility, fertilizers, pesticides spraying, tree grading and regular cutting etc. The total area is managed and maintained by dept. of Botany, Earn and Learn and NSS staff and students.

In the green house of Botanical garden cultivate *Aloe vera*, *Golden Durneda*, *Cycas*, *Hibiscus*, *Marigold*, *Sapota*, *Mango* plants, some rare *Orchids* and its form are grown in control condition.

College have 4160.58 sq. meters of play ground around this playground a green belt is developed number of tree plants were planted there, plants like *Azadiracata indica*, *Delbergia regia*, *Ficus bengalensis*, *cassia fistula*, *Albizialebac*, *Samania saman*, *Cassia fistula*, *Pongamia pinnata*, *Beutea monosperma*, *Peltophoram pterocarpum* etc. are present, gave shade to players

Tree Species

Sr. No	Name of the plant Species	Family	Common Name	Number
1	<i>Cocos nucifera</i>	Arecaceae	Coconut	35
2	<i>Polyalthia longifolia</i>	Annonaceae	False Ashok	40
3	<i>Ficus relegiosa</i>	Moraceae	Pipal	08
4	<i>Azadiracata indica</i>	Meliaceae	Neem	45
5	<i>Calatropis giganta</i>	Asclepideaceae	Rui	08
6	<i>Ficus racemosa</i>	Moreaceae	Umbar	07
7	<i>Delonex regia</i>	Caesalpiniaceae	Gulmohar	25
8	<i>Tamarindus indicum</i>	Fabaceae	Chinch	08
9	<i>Terminalia catappa</i>	Combretaceae	Badam	18
10	<i>Punicagrantum</i>	Lythraceae	Dalimb	08
11	<i>Bauhinia racemosa</i>	Fabaceae	Appata	35
12	<i>Arecaceae</i>	Arecaceae	Bottle Palm	16
14	<i>Bambusoideae</i>	poaceae	Bamboo	06
15	<i>Pithecellobium dulce</i>	Fabaceae	Manila thorn	05
16	<i>Syzygiumcumini</i>	Myriteaceae	Jambhul	03
18	<i>Racinuscommunis</i>	Euphorbiaceae	Erand	04
19	<i>Grevillea robusta</i>	Proteaceae	Silver oak	40
20	<i>Annona reticulata</i>	Annonaceae	Ramphal	02
21	<i>Cesalpinioideae</i>	Cesalpineaceae	Khair	05
22	<i>Cassia fistula</i>	Fabaceae	Bhava	12
23	<i>Holoptelea integrifolia</i>	Ulmaceae	Papadi	17
24	<i>Jatropha curcas</i>	Ephorbiaceae	Chandrajyoti	03
25	<i>Peltophorum petrocarpum</i>	Fabeaceae	Kasid	12
26	<i>Bombax ceiba</i>	Malvaceae	Katesavar	02
27	<i>Dalbargiasisoo</i>	Fabaceae	Indianroese wood	15
28	<i>Leucaena leucocephala</i>	Fabaceae	Subabul	25

29	<i>Vachellianilotica</i>	Fabaceae	Babul	02
30	<i>Ziziphus mauritiana</i>	Rhamnaceae	Bor	04
31	<i>Prunus avium</i>	Rosaceae	Cherry	03
33	<i>Thuja</i>	Cupressaceae	Thuja	10
34	<i>Ixora Coccinea</i>	Rubeaceae	Ixora	08
35	<i>Allamanda catheritica</i>	Apocycaceae	Allamanda	02
36	<i>Lantana camera</i>	Verbeneaceae	Gangutai	05
38	<i>Ceiba pentandra</i>	Malvaceae	Silk Cotton	10
39	<i>Jacranda acutifolia</i>	Bignoniaceae	Nilmohor	05
40	<i>Prosopis julifer</i>	Fabaceae	Vilayatishami	03
41	<i>SamaniasamanMerr</i>	Fabaceae	Rain tree	16
42	<i>Punica granatum</i>	Lythraceae	Dalimb	08
43	<i>Mangifera indica</i>	Anacardiaceae	Mango	10
44	<i>Manikarazapota</i>	Sapotaceae	Chiku	05
45	<i>Rosa damascena</i>	Rosaceae	Gulab	20
47	<i>Musa acuminata</i>	Musaceae	Banana	05
48	<i>Carica papaya</i>	Caricaceae	Papaya	10
49	<i>Psidium guajava</i>	Myrtaceae	Guava	02
50	<i>Aloe vera</i>	Asphodelaceae	korpad	30
51	<i>Hibiscus rosa-sinesis</i>	Malvaceae	Jaswand	20
52	<i>Tamarindus indicum</i>	Fabaceae	Chinch	15
54	<i>Pongamia pinnata</i>	Fabaceae	Karanj	30
55	<i>Durantaeracta</i>	Verbenaceae	Golden Duranta	57
56	<i>Mexican marigold</i>	Asteraceae	Zhendu	40
57	<i>Callistemon</i>	Myrataceae	Bottle Brush	02
58	<i>Annona squamosa</i>	Annonaceae	Sitaphal	05
59	<i>Cycas revoluta</i>	Cycadaceae	Cycas	08
60	<i>Cesalpinia pulchirima</i>	Fabeaceae	Peacock flower	07
61	<i>Osimum Santium</i>	Lamiaceae	Tulas	18
62	<i>Cestrum notcturnum</i>	Solanaceae	Ratrani	5
63	<i>Nepherolepis exaltata</i>	Polypodiacea	Fern	10
64	<i>Santalum album</i>	Santalaceae	Chandan	20
65	<i>Nerium oleander</i>	Apocyanaceae	Kanher	10
66	<i>Nimphyha nauchati</i>	Nymphaeaceae	Water lily	02

67	<i>Hydrilla verticillata</i>	Hydrocharitaceae	Waterthymes	02
68	<i>Chara</i>	Characeae	Chara	02
69	<i>Nelumbo nucifera</i>	Nelumbonaceae	Lotus	02
70	<i>Bambusoideae</i>	Bambusoideae	Bamboo	05
71	<i>Dracaena trifasciata</i>	Asparagaceae	Snake plant	05
72	<i>Justicia adathoda</i>	Acanthaceae	Adulsa	16
73	<i>Ficus elastica</i>	Moraceae	Rubeer	02
74	<i>Citrus limon</i>	Rutaceae	lemon	05
75	<i>Eucalyptus sps</i>	Myrtaceae	Nilgiri	10
78	<i>Azadirachta indica</i>	Meliaceae	Neem	46
79	<i>Ficus racemosa</i>	Moraceae	Umbar	08
81	<i>Dalbergia sisoo</i>	Fabaceae	Sisu	10
82	<i>Syzygium cumini</i>	Myrtaceae	Jamun	03
83	<i>Rosa canina</i>	Rosaceae	Rose	25
84	<i>Manihara zapota</i>	Sapotaceae	Chiku	03
85	<i>Alstoniascholaris</i>	Apocynaceae	Saptaparni	05
86	<i>Hibiscus rosa-sinesis</i>	Malvaceae	Jaswand	30
91	<i>Adathoda vasica</i>	Acanthaceae	Adulsa	08
93	<i>Bauhinia racemosa</i>	Fabaceae	Appata	25
94	<i>Delonix regia</i>	Caesalpiniaceae	Gulmohar	20
95	<i>Vinca rosasinesis</i>	Acanthaceae	Sadafuli	18
96	<i>Calatropis gigatna</i>	Asclepediaceae	Rui	10
97	<i>Gmelina arborea</i>	Lamiaceae	Shivan	08
98	<i>Milingtonia hortensis</i>	Bignoniaceae	Jasmine	15
99	<i>Bougainvelia spectagensis</i>	Nyctaginaceae	Kagdiful	05
100	<i>Agave americana</i>	Asparagaceae	Ghayapat	08
101	<i>Lilium</i>	Liliaceae	Liliy	35
102	<i>Croton</i>	Euphorbiaceae	Croton	25
103	<i>Asparagous officinalis</i>	Asparagaceae	Shatavari	10
104	<i>Draceneareflexa</i>	Asparagaceae	Dracaena	25
106	<i>Norway spruce</i>	pinaceae	Chirismas tree	03
107	<i>Vitex nirguda</i>	Acanthaceae	Nirgud	02
108	<i>Abelmoschus esculentus</i>	Terminalia bellirica	behda	03
109	<i>Plumeria alba</i>	Apocynaceae	chapha	15

Shrubs Species

Sr.No.	Botanical Name	Family	CommonName	Number
1	<i>Maytunesem arginata</i>	Celasraceae	Vekal	2
2	<i>Cassia sofera</i>	Fabaceae	Sopherasena	3
3	<i>Caesalpinia pulcherrima</i>	Fabaceae	Shakasur	14
4	<i>Cordia</i>	Boraginaceae	Cordia	04
5	<i>Tecoma stance</i>	Bignoniaceae	Yellow bells	11
6	<i>Dendrocalamus strectus</i>	Poaceae	Bamboo	04
7	<i>Jatropha curcas</i>	Ephorbiaceae	Chandrajyoti	02
8	<i>Cllistemonlan ceolatus</i>	Myrtaceae	Bottle brush	02
9	<i>Murraya paniculata</i>	Rutaceae	Ratrani	05
10	<i>Kirgenelia reticulata</i>	Ephorbiaceae	Datvan	03
11	<i>Hibiscus rosasinensis</i>	Malvaceae	China rose	05
12	<i>Brideliaretusa</i>	Phyllantheceae	Aarana	06
13	<i>Thujaorientalis</i>	Cupressaceae	Thuja	16

Crop Species

Sr.No.	Botanic l Name	Family	CommonName	Number
1	<i>Punicagranatum</i>	Punicaceae	Dalimb	08
2	<i>Annona squamosa</i>	Annonaceae	Seetaphal	08
3	<i>Moringa olefera</i>	Moringaceae	Shevaga	05
4	<i>Psidium guajava</i>	Myrtaceae	Peru	04
5	<i>Malingtonia sapota</i>	Sapotaceae	chiku	05
6	<i>Musa banana</i>	Musaceae	Banana	05
7.	<i>Papaya</i>	Euphorbiaceae	Papaya	05

Ornamental species

Sr.No.	Botanical Name	Family	Common Name	Number
1	<i>Ixora chinensis</i>	Rubiaceae	Ixora	03
2	<i>Nerium indicum</i>	Apocynaceae	Kanher	05
3	<i>Thevetia peruviana</i>	Apocynaceae	Pivalakanher	02

Main Entry Gate Green



Main Building Green



Competitive Exam Green Spot



Chemistry Department Green Spot



Botanical Garden



Front Space of College



b) Appreciation:

- Appreciate that the college campus has well maintained trees, shrubs, climbers, herbs, crop plants etc. These all plants have their own economic importance as well as environmental importance also. Most of the trees of the campus are medicinal plants and they have their economic importance also.
- Appreciate that college established Green Cell in college for the enactment, enforcement and review of the Environmental Policy.
- Appreciate that College authority forms committee tree plantation Programme and environmental awareness , this 'Vanmohatsav', 'Vruksharopan' Programme during rainy season. N.S.S. and N.C.C. students arranged 'Vrukshdindi' in town for the awareness of tree plantation.

Recommendations:

- Review periodically the list of trees planted in the garden, allot numbers to the trees and keep records.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects and community service.

Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings

The Department of Botany of Karmveer Abasaheb Alias N. M. Sonawane Arts, Commerce & Science College, Satana, was prepared carbon credit report as per Kyoto protocol 2002.

1 Plant = 20kg CO₂ absorbed per year

Total plant in College Campus=1364

1364*20=27300 kg CO₂ absorbed/year

For 4 years the CO₂ absorbed= 27300*4

=109200 kg CO₂ /4 Year

Annona Squamosa



Psidium guajava



Pomegranate



Sapota



Jatropha curcus



Brideliaretusa



A) AIR:

Air is one of the essential elements for sustainability of life on this planet. This is often most polluted by humans along with water. It is required monitor its quality frequently to establish its goodness. Physically due to greenery and absence of polluting industries are processes in the vicinity the air quality appears to be very good. In addition, the parking area and bus bay are maintained clean by paving and regular cleaning giving no scope for dust rise. Also, the road sides are all covered with plants and trees aiding for good air quality.



High Volume Sampler for Ambient Air Monitoring

Test Report

Meteorological Data / Environmental Conditions				
Average Wind Velocity: 3.0 km/h	Wind Direction: E	Relative Humidity (Max./Min.): 73/85 %	Temperature (Max./Min.): 36/20°C	Duration of Survey: 24 h
Parameter	Results		NAAQS 2009	Unit
Sulphur Dioxide (SO ₂)	20		80	µg/m ³
Nitrogen Dioxide (NO ₂)	21		80	µg/m ³
Particulate Matter (size less than 10 µm) or PM ₁₀	50		100	µg/m ³
Particulate Matter (size less than 2.5µm) or PM _{2.5}	18		60	µg/m ³
Ozone (O ₃)	<19.6		180	µg/m ³
Lead (Pb)	<0.02		1	µg/m ³
Carbon Monoxide (CO)	0.50		4	mg/m ³
Ammonia (NH ₃)	<4		400	µg/m ³
Benzene (C ₆ H ₆)	<1		5	µg/m ³

Meteorological Data / Environmental Conditions				
Average Wind Velocity: 3.0 km/h	Wind Direction: E	Relative Humidity (Max./Min.): 73/85 %	Temperature (Max./Min.): 36/20°C	Duration of Survey: 24 h
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Sulphur Dioxide (SO ₂)	20		80	µg/m ³
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Ozone (O ₃)	<19.6		180	µg/m ³
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Carbon Monoxide (CO)	0.50		4	mg/m ³
Ammonia (NH ₃)	<4		400	µg/m ³
Benzene (C ₆ H ₆)	<1		5	µg/m ³

Observation: All results of Ambient Air monitoring Near Main Gate& Near Garden found within limits as per National Ambient Air Quality Standards, 2009.

B) Noise Environment: The noise levels measurements were carried out using Noise level meter. The Noise level survey was carried out at two locations, at outside as well inside the study area campus. The major source of noise identified in the study area has been predominantly the vehicular movement and the transportation activities.

Noise Metre



Location	Time	1	2	3	4	5	Noise Level Readings dB (A)
Outside	11.00	55	50	57	56	55	54.6
	11.30	56	51	54	53	55	53.8
Inside	12.30	52	51	51	50	49	50.6
	13.30	48	52	50	53	50	50.6
As per The Noise Pollution (Regulation & Control) Rules, 2000 (Rules 3(1) and 4(1))							
Area Code	Area Type	Limits in dB (A)weighted scale					
		Day (6 a.m. to 10 p.m.)			Night (10 p.m. to 6 a.m.)		
C	Residential	52.4			45		

Observation: All results of Noise level monitoring (Inside & Outside) found within limits as per the Noise Pollution (Regulation & Control) Rules, 2000

C)Illumination Study: The Illumination Study were carried out using Lux meter. The Illumination Study was carried out at two locations, in Classroom & Laboratory.

Sr. No.	Location	Time	Lux Level Reading (LUX)				Average LUX
			1	2	3	4	
1.	Classroom	12:00	570	578	590	570	577
2.	Laboratory	12:30	580	550	520	528	544.5

Observation: All results of Illumination Study (Classroom & Laboratory) found within limits as per MF Rules-Section-35, Schedule B

D) Ventilation Study: The ventilation study was carried out by using anemometer. The ventilation study was carried out at two locations, in classroom and in laboratory.



Anemometer



Low Volume Sampler

Sr. No.	Name of Location	Temperature (°C)	Relative Humidity (%)	Air velocity (m/s)
1.	Classroom	34.6	34.4	0.7
2.	Laboratory	32	32	0.9

E) Workplace Monitoring: The Workplace Monitoring study was carried out by using Low Volume sampler. The Workplace Monitoring study was carried out at classroom.

Observations: The Workplace Monitoring study was carried out in Classroom. It was observed that all parameters are within limits.

Parameters	Result	Limits as Per OSHA	Unit
Suspended Particulate Matter (SPM)	0.42	15	mg/m ³
Sulphur Dioxide (SO ₂)	0.11	13	mg/m ³
Nitrogen Dioxide (NO ₂)	0.09	9	mg/m ³

4.1. Water Use

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

a) Observations

The study observed that Nashik Municipal Corporation is the main source of water for the campus. Water is used for drinking purpose from with two connections. Water is used for canteen, toilets, laboratory and gardening, basketball ground from tank. During the survey, no loss of water is observed, neither by any leakages nor by over flow of water from overhead tanks. The data collected from all the departments is examined and verified. On an average the total use of water in the college is 5,000 L/day, which include 5,000 L/day for domestic purposes and 3,000 L/day for different laboratories.

The College has rain water harvesting facility in a campus having capacity 150000 lit. And the water from the tank is used for gardening and basketball court washing purpose. So, the College has saved 150 M³ water per year. The total amount of water consumption is reduced by this facility.

The College has Reverse Osmosis process for drinking water in a campus having capacity of 1000 liters/hr. and the rejected water from this Reverse Osmosis is used for the sanitary purpose. From the Canteen, water used for drinking purpose analyzed as per IS 10500:2005 drinking water specification and observed it was potable.

Test Report

Sr. No.	Parameters	Results	Acceptable Limit as per IS 10500: 2012	Units
1.	Colour	1	Max. 5	Hazen Units
2.	Odour	Agreeable	Agreeable	-
3.	pH	7.34	6.5-8.5	-
4.	Turbidity	0.7	Max. 1	N.T.U.
5.	Total Dissolved Solids	86	Max. 500	mg/L
6.	Calcium (as Ca)	9	Max. 75	mg/L
7.	Chloride (as Cl)	18	Max. 250	mg/L
8.	Fluoride (as F)	<0.05	Max. 1	mg/L
9.	Iron (as Fe)	<0.06	Max. 0.3	mg/L
10.	Magnesium (as Mg)	3.88	Max. 30	mg/L
11.	Nitrate (as NO ₃)	4.60	Max. 45	mg/L
12.	Sulphate (as SO ₄)	4.80	Max. 200	mg/L
13.	Alkalinity (as CaCO ₃)	26	Max. 200	mg/L
14.	Total Hardness (as CaCO ₃)	40	Max. 200	mg/L
15.	<i>E. coli</i>	Absent	Not Detectable	/100 ml
16.	Total Coliforms	Absent	Not Detectable	/100 ml



RO Unit

b) Appreciations:

- Water is properly used in the campus and water reusing strategy is followed by the college like reusing R.O. rejected water for sanitary purpose.

c) Recommendations:

- Appreciate that Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged. In campus small scale/medium scale/ large scale reuse and recycle of water system is necessary.
- The college does not have waste water treatment for waste water generated from laboratories, canteen, hostel kitchen, toilets, bathrooms and office rooms. But final year students of Civil Engineering Department are working on the designing of Sewage Treatment Plant and soon the plant will be installed in the premises.
- Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
- Year wise water consumption report.

Energy Use and Conservation

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

a) Observations

Energy source utilized by all the departments and common facility center is electricity only. Total energy consumption is determined as 3094 KVA/Year by major energy consuming equipment.

Energy today has become a key factor in deciding the product cost at micro level as well as in dictating the inflation and the debt burden at the macro level. Energy cost is a significant factor in economic activity at par with factors of production like capital, land and labor. The imperatives of an energy shortage situation call

for energy conservation measure, which essentially mean using less energy for the same level of activity. Energy Audit attempts to balance the total energy inputs with its use and serves to identify all the energy streams in the systems and quantifies energy usages according to its discrete function. Energy Audit helps in energy cost optimization, pollution control, safety aspects and suggests the methods to improve the operating & maintenance practices of the system. It is instrumental in coping with the situation of variation in energy cost availability, reliability of energy supply, decision on appropriate energy mix, decision on using improved energy conservation equipment's instrumentation's and technology.

The total number of FTL is 211 each one having wattage of 40W. By simply replacing These FTL's with light emitting diodes (LEDs) each one of 12W power consumption can be reduced. **Total Power consumption saved 432 KWHr per month.**

Total number of FAN is 155 each one of 80W. By simply replacing all these FAN's with energy efficient FAN's of 40W power consumption can be reduced. **Total power consumption saved 445KWHr per month**

Sr No	Equipments	Quantity	Wattage	Working Hours per day	Total Power Consumption per month in KWHr
1	FTL	211	40	3	603.6
2	CFL	84	12	3	87.76
3	Fan	155	80	3	891
4	PC	105	50	3	470
5	AC	8	1000	1	240
6	Freeze	9			380
7	LAN,CCTV controller	2	80	24	115
8	Printer	25	50		37.5
9	Monitor	2	6	24	8.6
10	Oven	2	2.5	1	150
11	Xerox	2	4.4		30
12	Others				81
				Total	3094.46

Photovoltaic cell





b) Appreciations:

- Energy conservation is one of the best practices followed by the staff and students of Department of Physics and Electronic Science, Karmveer Abasaheb Alias N.M. Sonawane Arts, Commerce & Science College Satana
- Due to Solar System the College has reduced power consumption up to 800KWHr per month
- The College has used Remedies to reduce power consumption, and it reduced upto 1027 KWHr per month

c) Recommendations :

- This includes evaluation of procurement practices with ISO 50001. This does not exactly mean that you need to buy the most efficient, but you need to buy

the most efficient which is financially viable. Example AC with efficiency star ratings, Transformer etc.

- Centralized controls of lighting, auditorium etc. to avoid any mis-use of electricity.
- Shift to paperless regime wherever not required, example attendance muster replaced by biometrics, DG logbook replaced by computerised logbook, daily reports converted from paper to paper less, HOD meetings converted to paperless formats, and all such examples.
- Maintenance of solar lamps in the campus is necessary.

Waste Generation

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus. The different solid wastes collected as mentioned above.

a) Observations

The College have various facilities and techniques for the management of degradable and non-degradable waste. The primary focus is to reduce, reuse and recycle the waste. The institute has constituted a committee that deal with the minimization of waste. Every day the waste is collected in bins and sent to waste management of city

The College has followed the Following principles for waste management:

1. Principles- Refuse, Reduce, Reuse and Recycle
2. Segregation of Waste at Source
3. Different treatment for different type of waste
4. Disposal at nearest possible point.
5. Rain Water Harvesting

Solid Waste Management:

The college has well organized many activities for disposing the waste. In the college campus solid types of wastes consist of waste papers, fallen leaves, food waste generated in college Botanical Garden and Main Building, canteen and hostel mess. The waste is separated at source only and according to type of waste is disposed. The college have a waste food material dumping machine in this machine waste food material is dumped. After several week waste material started to decompose to form a manure, then it is used for the plantation in college campus.



Use of Dustbins: In the college campus, we have placed dustbin at various department. Where dry and wet waste is collected in the separate dustbin. Dry waste sent to waste management of the city



Dust Bins

Vermicomposting Units: The organic waste produced in the college is subjected to vermicomposting. There are about 1 units of vermicomposting. The organic manure so produced is utilized for the fertilizing the trees and plantation in the college campus.



Vermicompost Unit

Septic Tank: The ample of septic tank are constructed adjacent to washrooms and hostels for collection and basic treatment to the sewage waste. The organic solids are settled and digested by anaerobic treatment. The separated liquid effluent is slowly discharged into the soa



Drainage System

b) Appreciations:

- Appreciate that college campus is well equipped with dry and wet waste collection system having colour coding blue and green. Among that green coloured dustbin is used for wet waste and blue colour is used for dry waste.

c) Recommendations

- Reduce the absolute amount of waste that produces from college staff offices.
- Make full use of all recycling facilities provided by City Municipality and private suppliers, including glass, cans, white coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture.
- Provide sufficient, accessible and well-publicized collection points for recyclable waste with responsibility for recycling clearly allocated.
- Important and confidential papers after their validity to be sent for pulping.

E-Waste Generation

E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. This makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

a) Observations:

The College has following E-waste created from last five years.

Sr.No	Name of instrument	Number
1.	Computer CPU	20
2.	Keyboard	15
3.	Monitor	30
4.	Mouse	18
5.	Printer	10
6.	Xerox Machine	05

The E-waste generally includes the tube lights, CFL, LED are stored into the scrap yard of college and stored. E-waste generated in the campus is very less in quantity. The college has total of 105 computers and 25 printers in working condition. The cartridges of laser printers are refilled outside the college campus. Administration conducts the awareness programmes regarding E-waste Management with the help of various departments. The E- waste and defective item from computer laboratory is being stored properly. The institution has

decided to contact approved E-waste management and disposal facility in order to dispose E-waste in scientific manner.

b) Recommendations:

- Recycle or safely dispose of white goods, computers and electrical appliances.
- Use reusable resources and containers and avoid unnecessary packaging where possible.
- Always purchase recycled resources where these are both suitable and available.

Photo Gallery



Marathi Bhasha Din



World Women Day



Rajmata Jijau Jayanti

5. Conclusions

Considering the fact that the institution is predominantly an Art's, Commerce and Science College, there is significant environmental awareness both by faculty and students and initiatives taken by them are substantial. The installation of solar panels, rain water harvesting management, reuse of R.O. water, paperless work system and anaerobic composting practices are noteworthy. Besides, environmental awareness programmes initiated by the administration shows how the campus is going to be a green. Few recommendations are added to curb the menace of waste management using ecofriendly and scientific techniques.

As part of green audit of campus, we carried out the environmental monitoring of campus includes Illumination, 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. Noise level in the campus well within the limit i.e., below 50 dB at day time. Canteen water also analyzed and found it was potable.

This may lead to the prosperous future in context of Green Campus and thus sustainable environment and community development.

6. Acknowledgement

We are grateful to the committee members of K.A.A.N.M.S. Art's, Commerce and Science College Satana Nashik-423301, to award this prestigious project and allowed us to enter the new era of Green Audit in the College Campus.

Further we sincerely thank the college staff for providing us necessary facilities and co-operation during the audit. This helped us in making the audit, a success.

Further we hope, this will boost the new generation to take care of Environment and propagate these views for many generations to come.

AEC/Letter/2023/11

30.05.2023

GREEN AUDIT REPORT INCLUSIVE OF ENERGY CONSERVATIONS

of

K.A.A.N.M.S. Art's, Commerce and Science College Satana Nashik

Conclusion and Summary of Findings

1. The College is well landscaped, and the green cover is reasonably good, and they are found to be increasing the green cover on a continuous basis.
2. The College campus has well maintained trees, shrubs, climbers, herbs, crop plants(Total 1364 Plants). These all plants have their own economic importance as well as environmental importance also **absorbed 27300 kg CO2 /year**
3. College has provided wet waste, dry waste and semi dry waste bins for segregation and collection of solid waste. This has been done in entire campus in open space and inside the buildings. The system is working efficiently
4. The water quality in the campus including that of canteen is tested and found potable.
5. The College has Rainwater harvesting system which is efficient and sufficient.

6. The College has created great awareness among the students and staff about the green practices.
7. The College canteen waste is composted and used as manure for the green cover of the campus.
8. College has provided wet waste, dry waste and semi dry waste bins for segregation and collection of solid waste. This has been done in entire campus in open space and inside the buildings. The system is working efficiently
9. Noise level in Classrooms and labs is found less than 50 db which is within the safe limits as per Noise Pollution Control rules, 2000.
10. Ventilation study found satisfactory.
11. All results of Illumination studies (Classrooms and labs) found within limit as per Factory rules Section 35 Schedule B.
12. The College has Sewage Treatment Plant, treated water used for gardening purpose.
13. College actively Participate in cleanliness drive regularly.
14. College organizes Energy Conservations Awareness Programs for Students and Staff.

For Ashwamedh Engineers & Consultants

Khandge

Authorized Signatory

