

Report of the Green Audit

2018 - 2019



Nagar Parishad Mowad's

Nagar Parishad Shivaji Mahavidyalaya, Mowad

Th. Narkhed, Dist. Nagpur- 441303

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This report describes the status of environmental management at Nagar Parishad Shivaji Mahavidyalaya, Mowad. The report provides an overall idea about existing conditions, efforts taken to make the area green compliant, waste management, water uses, energy use and conservation, sewage management and increasing awareness amongst stakeholders etc.

The reports helps in understanding the activities carried out by the college team including Principal, Teaching and Non-teaching staffs and the students as a responsible educational citizen and provides guidance on further scope for improvement. This report is prepared based on the onsite visit and the evidences produced by the IQAC of the college during the course of audit. The auditing was done for the year 2018-19. The report was completed and submitted on 03/01/2019.

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Executive Summary

The National Assessment and Accreditation Council (NAAC), Bangalore has made it mandatory to all Higher Educational Institutions should submit an annual Green Audit Report. In view of the NAAC circular regarding Green Auditing, the College Management decided to conduct an external Green Audit by a competent Paryavaran Snehi Sanstaha, Katol with a Green Audit Assessment Team.

In accordance with the Risk-Based Audit and Evaluation Plan of Nagar Parishad Shivaji Mahavidyalaya, Mowad for 2018-19, the Assessment team of Paryavaran Snehi Sanstaha, Katol conducted a green audit in December, 2018.

The purpose of the audit was to make sure that the practices followed within the campus are in accordance with the Green Policy adopted by the institution. With this in mind, the precise objectives of the audit were to evaluate the adequacy of the internal control framework of Environment Sustainability also as the degree to which the institute are in compliance with the applicable regulations, policies and standards. During the initial planning of the audit, an analysis was conducted so as to spot evaluate and prioritize the risks associated with the environmental sustainability. The analysis was based upon an examination of the policies, manuals and standards that govern the environmental sustainability, on data analysis, and on the results of preliminary interviews with personnel considered key within the environmental management in the campus. The methodology includes preparation and filling up of questionnaire, interviewing key persons and data analysis, measurements and recommendations. The criteria and methods used in the audit were based on the identified risks.

1. Introduction

The environment where we live within is of utmost concern since it is directly related to the survival. Keeping it healthy is the responsibility of each and every individual. After Earth Summit Rio 1992, the concept of environmental audit was accepted by many countries (Langi, Bhushan & Gurav, Minakshi & Patil, Sunil. (2019). GREEN AUDIT IN ACADEMIC INSTITUTES.). An environmental audit is a type of evaluation intended to identify environmental compliance and management system implementation gaps, along with related corrective actions. The term “Green” means eco-friendly, this can acronymically is called as Global Readiness in Ensuring Ecological Neutrality (GREEN). Green Auditing, an umbrella term, is known by another name Environmental Auditing. There is a provision of green audit in college campus. A committee has been formed to monitor the proper conservation and plantation of the plants in the campus. As per the suggestions made by NAAC, it is the responsibility of the every college to do green audit every year.

The ‘Green Audit’ aims to analyse 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 of carrying out Green Audit.

1.1 About College

Nagar Parishad Shivaji Mahavidyalaya, Mowad was established in the year 1997. It was accredited by NAAC Bangalore with B grade in Cycle 2 in the year 2015. The college has its own building and beautiful campus of 3 Acres area. The college actively participated in Swacha Bharat Abhiyan in association with its management Nagar Parishad Mowad. The College has active N.S.S. units sanctioned by the university, which are doing tremendous job through organizing activities like blood donations, Cleanliness programme, tree plantations, health check-up, personality development etc. The college has also adopted the ‘Green Campus’ system for environmental and sustainability. There are main three pillars i.e. zero environmental foot print. Positive impact on occupant health and performance and 100% graduates demonstrating environment literacy. The goal is to reduce CO2 emission, energy and water use. While creating an atmosphere where students can learn and be healthy. The

college administrative work on the several facts of 'Green Campus' including Water conservation, tree plantation, waste management, save paper work and energy consumption. The college has Environment science as a compulsory subject for second year student only and active green audit committee.

2. Objectives of the Green Audit

- To review the implementation of the environmental policy.
- To assess environmental performance.
- To assess whether investments made in increasing awareness among students regarding electricity, biodiversity and environment have helped the Institution achieve the required carbon dioxide emission and absorption in the campus.
- To introduce and aware students to real concerns of environment and its Sustainability.
- To assess whether non-academic activities of the Institution support the collection, recovery, reuse and recycling of solid wastes that harm the environment.
- To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use of the campus.
- To identify gaps and suggest recommendations to improve the Green Campus status of the institution.
- To bring out a status report on environmental compliance.

3. Methodology

The methodology adopted to conduct the Green Audit of the Institution included different tools such as preparation of questionnaire, onsite visit, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the some areas to summarise the present status of environment management in the campus i.e. Land management, Air quality management, Water management, Energy Conservation, Waste management, E-waste management, Green area management.

4. Observations and Recommendations

4.1 Land Use

This indicator addresses total land, uses of land, gardening, and plantation area inside and outside the building play ground, space for parking etc., A land audit is an on-site survey and assessment to determine the land use and hence improving the efficiency of its use.

4.1.1 Observations

We observed that college has 3 acres of land area. In front side of the college there is land reserve for gardening purpose, and available space for parking. There is no parking shed found in the college campus. At the back side of the college land is reserved for play ground. The overall area of the campus is protected with compound. Inside the college building carries are maintained for small tree plantations, some flora and fauna are planted inside the carries. College has still some cultivation of ornamentals in pot gardening to have rich green effect.



Fig. 1 Plats in the campus



Fig. 2 Land cleanliness programme

4.1.2 Recommendations

- Cleaning of land area properly.
- As of now there is a count of the trees being planted.
- Localized species can be more used for plantation like Nim, Mango, Pipal, Gulmohar etc. since they are more suitable to the local environment and habitat.
- It can become a habitat of the native birds, animals and insects and can help in biodiversity conservation and reclamation.
- A count of variety of species can also be kept handy. It can be treated as a structural biodiversity creation effort for achieving substantial positive results.

4.2 Air Quality

This indicator addresses air quality, various atmospheric pollutants and pollution by staff and students vehicle etc. A Air audit is an on-site survey and assessment to determine the air quality and hence improving the efficiency in it.

4.2.1 Observations

In total, based on our data collected, there are 196 plants in the college campus contribute to the Oxygen supply that the college utilize. Being situated in the semi urban area, college is exposed to various atmospheric pollutants from vehicles as well as by other external means. Based on our calculation, the different sources of carbon dioxide emitted to college are:

- a) Staff and students vehicle
- b) Computers in the College.
- c) Printers in the college.
- d) Water Cooler
- e) RO Purification System
- f) Tube lights and LEDs.
- g) Overhead Projector in the class room.

On the days of data collection, there were 5 cars, 7 bikes and 1 scooty found in campus, which in turn proves us that these vehicles may contribute to high carbon dioxide emission. There are 10 computers, 5 printers, 3 Overhead Projector, 1 water cooler 1 RO Water Purifier system and number of tube lights and LEDs lights found in the campus. The students, teaching and nonteaching staff and the visitors also contribute to carbon dioxide emission.

4.2.2 Recommendations

- Look in to the more possibility of on-site micro-generation of renewable electricity.
- Give preference to the most energy efficient and environmentally sound appliances available, this includes only using energy-saving light bulbs.
- Make available information about bicycle and pedestrian routes, public transport services and car share schemes to staff and students.
- Promote sharing of vehicles among the students and faculty members.

4.3 Water Use

This indicator addresses water consumption, water source, irrigation, storm water, appliance 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.

4.3.1 Observations

It is observed that the main source of water supply for the institute is a bore well. Water is used for drinking purpose, toilets and gardening. During the survey, no loss of water is observed, neither by any leakages, nor by over flow of water from overhead tanks. There are 5 Water Tanks, 1 Water Cooler found during the survey. The data collected from all departments is examined and verified. On an average the total use of water in the college is 5,000 L/day. Which include 1,000 L/day for domestic purpose, 4,000 L/day for gardening. The drinking water is periodically tested by Municipal Council Mowad ensured its portability for drinking purpose. Five rain water harvesting units are also functional for storing and reuse. Gardens are watered by using drip irrigation system to save water. This is one of the unique steps towards greening practices.



Fig. 3 Bore well, Water Storage Units, Water Cooler and RO Water Purifier System



Fig. 4 Water harvesting zones

4.3.2 Recommendations

- Further to the provisions of water in the institution, methods can be applied to use the rainwater harvesting water for drinking and sanitary purposes by advanced water treatments.
- Specific efforts for conservation of fresh water through auto water taps based on occupancy sensing mechanism.
- In campus small scale/medium scale/ large scale reuse and recycle of water system is necessary.
- The wastage water by RO Purifier is use for tree or various purposes.
- Ensure that the equipment's used for such usage are regularly serviced.
- Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged.

4.4 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.

4.4.1 Observations

Mahadiscom is the major source of electricity. 15500 KWH is the requirement of the college. The fulfilled with the Mahadiscom supply to the institute. In the terms of units, institute needs 350 units per month. There is solar system in the college it fulfil some energy

needs of the college. It is found that energy source utilized by the entire department in its daily activity. . All the department and common facility Centre are equipped with LED lamps. 30 LED lamps are counted during survey. The Solar panel generation device generates 4 KWH per day. The college is now using 1.5 kW UPS and batteries for energy storage. This solar panel system has shared the load of 140 KWH/ month from the overall requirement of 350 units per month from the conventional source. Energy audit has been conducted and the recommendation has also been implemented specifically for replacement of regular tubes and bulbs with LED bulbs and tubes.



Fig. 5 The Solar panel generation device

4.4.2 Recommendations

- Support renewable and carbon-natural electricity options on energy-purchasing Consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-natural sources.
- Periodic energy audits can be planned to have enough data on savings and contribution through use of green energy. Occupancy sensors can be planned to avoid manual intervention in shutting off and starting on the lighting systems in various rooms.
- Switch off the Fans, lights when it is not in use.
- Use of star energy rating equipments in the campus.
- Shut down computers when it not in use.

4.5 Solid Waste Management

This indicator addresses waste production and disposal of different wastes like paper, 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 collected as mentioned above.

4.5.1 Observations

Total solid waste collected in the campus is 10 kg/day. Waste generation from tree dropping and lawn management is a major solid waste generated in the campus. The waste is segregated at source by providing separate dustbin for bio-degradable and plastic waste. Plastic waste is almost nil. Metal waste and wooden waste is stored and given to authorized scrap agents for further processing.

Vermicomposting project

Vermicomposting is a simple biotechnological process of composting, in which certain species of earthworms are used to enhance the process of waste conversion and produce a better end product. The institute has adopted permaculture composting culture house on 300 sq-ft land. The main purpose of this is to reduce disposable waste in the college

campus. After complete process of vermicomposting, it is use as manure in the garden and lawns.



Fig. 6 Vermicomposting unit.



Fig. 7 Solid waste container

4.5.2 Recommendation

- Quantification of every day solid waste can be taken up and it can also be displayed in the campus to refrain and educate the students and staff about the wastages and losses to the environment and human efforts.
- Reduce the absolute amount of waste that it produced from college staff office.
- Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated.
- Library craps are given to the vendors who recycle it.
- Important and confidential papers after their validity to be sent for pulping.

4.6 E- Waste Management

This indicator addresses E- Waste production and disposal of different e-wastes. The survey focused on volume, type and current management practice of E-Waste collected.

4.6.1 Observations

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 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. Since the organization is well established and equipped with the necessary and up-to-date electronic infrastructure, the e-waste generation is very minimal. However, as a proactive initiative, an authorized vendor is identified for disposal of e-waste in case it is generated. The cartridges of laser printer are refilled outside the college campus. 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.

4.6.2 Recommendations

- E-waste listing and quantification in detail can be useful further to reduce the e-waste generation.
- Recycle or safely dispose of white goods, computers and electrical appliances.

4.7 Sewage

This indicator addresses Sewage production of the college. The survey focused on volume, and current management practice of domestic sewage management.

4.7.1 Observations

Domestic sewage is generated through the use of water for sanitary purposes. The sewage generated after the use is connected through the underground sewage tanks. It is found during the survey that domestic sewage of the college is not connected to the municipal sewer lines because there is no Municipal Sewage line in this area.



Fig. 8 Sewage Tanks in the college

4.7.2 Recommendations

Based on the population of each day and the daily water supply quantities, domestic sewage can be quantified for further water conservation purpose. Specific water audit can be conducted to know the water inflow and out flow along with the losses, leakages, wastages etc. so as to plan actions for water conservation.

4.8 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.

4.8.1 Observations

Campus is located in the vicinity of many trees to maintain the bio-diversity. To create- green cover, eco-friendly atmosphere, pure oxygen at the college campus, plantation program is organized every year with involving all students, principal, and all departments faculty members. With the help of Municipal Council Mowad and NSS unit of the college, tree plantation programme was conducted every year in the month of July. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. To keep the greeneries in the campus, college regularly maintain the gardens which are looked after by paid staff under the guidance of peon of the college. Moreover, every year college try to plant new trees. Seasonal flower garden is also a unique feature of this college. During survey it is found that college has many type of tress in the campus some major trees are as follows.

A) Identification of Plant Species

Sr. No.	Local Name of the Plant	Botanical Name	Family	Count
1	Sheesham	Dalbergia sissoo	Papilionaceae	04
2	Amala	Embllica officinalis	Euphorbiaceae	01
3	Aam (Mango)	Mangifera indica	Anacardiaceae	02
4	Ashok	Polyanthia longifolia	Annonaceae	14
5	Karanji	Pongamia pinnata	Papilionaceae	01
6	Jamun	Syzygium cuminii	Myrtaceae	02
7	Sag	Tectona grandis	Verbenaceae F	03
8	Sitaphal	Annona squamosa L.	Annonaceae	01
9	Rui	Calotropis procera	Asclepiadaceae	10
10	Sadaphuli	Catharanthus roseus	Apocynaceae	02
11	Jaswand	Hibiscus rosa- sinensis	Malvaceae	02
12	Laajaalu	Mimosa pudica	Mimosaceae	150+
13	Tulas	Ocimum sanctum	Lamiaceae	30
14	Neem Trees	Azadirachta Indica	Meliaceae	13
15	Ber Tree	Zizyphus Mauritian	Rhamnaceae	04
16	Ramphal	Annona reticulata.	Annonaceae	01
17	Pipal	Ficus religiosa	Moraceae	02
18	Vidya	Thuja	Cupressaceous	06
19	Palm	Dypsis lutescens	Arecaceae	20
20	Ficus	Ficus benjamina	Moraceae	03
21	Boganwel	Bougainvillea	Nyctaginaceae	04
22	Babhul	Acacia nilotica	Fabaceae	10
23	Saptarni	Alstonia scholaris	Apocynaceae	37
24	Sweet Neem	Murraya koenigii	Rutaceae	02
25	Palas	Butea monosperma.	Fabaceae	02
26	Almond	Prunus dulcis	Rosaceae	01

B) List of bird species observed in the campus

S. No.	Common name	Scientific name
1	Black kite (Eagle)	Milvus Migrans
2	House sparrow	Passer Domesticus
3	Common Crow	Corvus Splendens
4	Kingfisher	Alcedo Atthis
5	common Myna	Acridotheres Tristis
6	Popat	Psittacula Krameri
7	Koel	Eudynamis Scolopaccus
8	Bagala	Platalea Leucorodia
9	Bhovari	Spilopelia Senegalensis
10	Sutar	Upupa Eops
11	Bulbul	Pycnonotus Cafer
12	Jungle babbler	Turdoides Striata

C) List of Insects observed in the campus

S. No.	Common name	Scientific name
1	Mashi (Common House Fly)	Musca domestica
2	Shikara (Drygonfly)	Anisoptera
3	Udhali	Isoptera
4	Mungi (Ant)	Formicidae
5	Madhmashi	Apis Cerena Indica
6	Butterfly	Rhopalocera
7	Makadi	Araneae
8	Ingali	Chilopoda
9	Maschar (Mosquito)	Culicidae
10	Gandul	Lumbricina



Fig. 9 Green Area of the college

4.8.2 Recommendations

- To maintain the college campus green and eco-friendly, more trees need to be planted.
- The plant diversity shall be maintained by avoiding the plantation of exotic plant species.
- Carbon neutrality can be maintained on the campus by developing more greenery.
- More trees need to be planted on near compound wall.
- Review periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Assign scientific names to the trees.
- Create awareness of environmental sustainability and take actions to ensure environmental sustainability.
- Indoor plantation to inculcate interest in students, Bonsai can be planted in corridors to bond a relation with nature.

- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and finding.
- Indian species must be planted in the campus every year like Vad, Nim, Pipal, Fanas, Imali, Jamun etc.
- In addition to above some flowering plants, shrubs, herbs, and climber plants species will also be planted for beautification in the campus.

4.9 Suggestions

- Increase Awareness of Environmentally Sustainable Development- Use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.
- Educate for Environmentally Responsible Citizenship- Establish programs to produce expertise in environmental management, sustainable economic development, population, and related field with help of environment science subject to ensure that all students are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.
- Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
- Do green audit regularly.
- Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- Encourage the faculties and students to plant trees in the college campus.


4.10 Conclusion


Green Audit is the most efficient way to identify the strength and weakness of environmental sustainable practices and to find a way to solve problem. Green Audit is one kind of professional approach towards a responsible way in utilising economic,


financial, social and environmental resources. There is scope for further improvement, particularly in relation to waste, energy and water management. The college in recent years consider the environmental impacts of most of its actions and makes a concerted effort to act in an environmentally responsible manner. Even though the college does perform fairly well, the recommendations in this report highlight many ways in which the college can work to improve its actions and become a more sustainable institution.

FOR Paryavaran Snehi Bahuuddeshiya Sanstha, Katol

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