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GREEN AUDIT REPORT

NASRA COLLEGE OF ARTS AND SCIENCE TIRURKAD



Dr. P. Zubair
Principal
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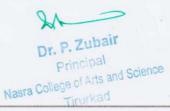
1. Background and Need Assessment

The goal of green auditing is to evaluate the current environmental conditions and promote environmentally friendly habits among students. In line with this objective, Nasra College of Arts and Science Tirurkad has chosen to undergo a GREEN AUDIT. Additionally, the college plans to enlist a professional organization to carry out the auditing process.

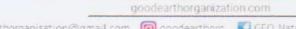
The Green Audit proves to be the most effective and environmentally conscious approach to addressing environmental issues. Conducting experiments in nature without disregarding natural principles is a significant factor driving the Green Audit process. This professional care is the responsibility of individuals involved in economic, financial, social, and environmental factors. Implementing green audits on college campuses is crucial as it raises awareness among students about the process's benefits in preserving the planet, fostering a sense of responsibility, and contributing to their development as responsible citizens. Hence, a Green Audit is imperative at the college level.

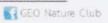
Green Audit encompasses practices such as energy conservation, utilizing renewable sources, rainwater harvesting, striving for carbon neutrality, plantation, hazardous waste management, and E-waste management. Additionally, the Green Audit is a prerequisite for the NAAC Committee evaluation of the junior college. Beyond educational institutions, industries employ Green Audit as a management tool to assess environmental standards, enabling them to enhance performance and contribute to the sustainable development of the organization. The avoidance of natural rules in experiments on nature is a significant factor prompting the need for Green Audit.

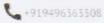
The concept of "Green audit for an academic college" has been introduced to ensure the environmental sustainability of educational institutions. It involves a systematic process of identifying, quantifying, recording, reporting, and analyzing components of environmental diversity. The goal of the "Green Audit" is to assess environmental practices both within and outside the college campus, influencing the creation of an eco-friendly atmosphere. Conducting a Green Audit provides guidance on improving environmental conditions, and various factors have contributed to the growing adoption of this practice.



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Preserving the campus environment involves implementing various measures such as promoting energy savings, waste recycling, water reduction, and water harvesting-crucial steps to safeguard the planet. Conducting a green audit in college campuses is essential as it familiarizes students with its benefits, fostering a sense of responsibility as good citizens. The green audit and sustainable development processes contribute to waste reduction, cost efficiency, and improved product quality.

There exists a clear connection between Green Audit and the sustainable development of any business organization. Key prerequisites for achieving sustainable development include establishing a Green Audit policy, implementing a robust framework, ensuring accurate execution, and analyzing results. A strong Green Audit process facilitates sustainability, and the framework helps organizations attain their set goals. The link between Green Audit and the sustainable development process is evident in their shared impact on reducing waste, cutting associated costs, and enhancing product quality.

2 Audit Team

The Nasra College of Arts and Science College Tirurkad, has decided to conduct the Green Audit in association with a competent agency with active involvement of student and teachers in the College. With this aim it was decided to conduct the Environmental Auditing / Green Auditing of the College jointly with a team from the College in association with an external competent Organization Viz; The Good Earth Organisation.

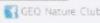
2.1 Internal Audit Team

A team of faculty and students of Nasra college of Arts and Science Tirurkad, involved in collection of baseline data for the Audit by involving Nature Club and NSS club functioning the College. Shafeeq. T from the department of Commerce, and Adib.E from the department of Commerce were the members of the internal Green Audit Team.

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2.2 External Audit Team

The Good Earth Organization, a dedicated environmental non-profit organization in Kerala, is committed to promoting sustainability and raising awareness about environmental and wildlife issues. In alignment with our mission, we propose to initiate an Environmental Auditing awareness program in collaboration with ten selected educational institutions situated in the Kozhikode and Malappuram districts of Kerala. This program's overarching goal is to empower these institutions and their volunteers with the knowledge and skills required for conducting environmental audits. By doing so, we aim to foster a culture of sustainability and responsible environmental practices within their campuses and the wider community.

Address : Good Earth Organisation Vazhakkad PO Malappuram dist 673640 Email goodearthorganisation@gmail.com

3. SCOPE AND OBJECTIVES OF GREEN AUDITING:

The primary focus of Green Auditing lies in its utmost importance, representing a professional duty for individuals engaged in economic, financial, social, and environmental processes.

Key Objectives of Nasra College of Arts and Science Green Audit:

- Evaluate the effectiveness of measures implemented in reducing the Carbon Footprint.
- Safeguard human health by identifying and mitigating threats.
- Ensure adherence to rules and regulations.
- Prevent environmental disruptions with high correction costs.
- Identify gaps and propose recommendations for enhancing the institution's Green Campus status.

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4. Benefits of the Green Auditing

- Empower the organizations to frame a better environmental performance
- More efficient resource management to create a green campus.
- · To enable waste management through reduction of waste generation, solid- waste and water recycling.
- To create a plastic free campus and evolve health consciousness among the stakeholders.
- Recognize the cost saving methods through waste minimizing and managing.
- · Authenticate conformity with the implemented laws.
- Enhance the alertness for environmental guidelines and duties.
- Impart environmental education through systematic environmental management approach and improving environmental standards.
- Development of ownership, personal and social responsibility for the College and its
- environment.
- Cost savings through reduction in resource usage through benchmark
- Develop the Social and Environmental awareness for the institute and students
- Enhancement of institutes profile
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college.

Target Areas of Green Auditing

Green Auditing of educational institute focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, promotes personal action, reduce the institute's energy and water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this Green auditing is water, energy, waste, green campus and carbon footprint.

6. Areas of Green Auditing

- 1. Water Management Audit
- 2. Waste Management Audit.
- 3. Energy Management Audit
- 5. Using Renewable Energy Audit
- 6. Carbon Footprint Audit.

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7. Rain water harvesting structures and utilisation in the campus

With the average annual rainfall for Kerala at 3107mm, Malappuram district gets an average annual precipitation of 1446 mm, spread over nearly 240 days. Adequate and uninterrupted water supply for drinking, personal use, gardening, agriculture, and animal husbandry, is uncertain in several districts of Kerala, especially in the northern districts including Malappuram. Water conservation is hence an essential activity that should be pursued as part of the greening initiatives.

Nasra College campus with a campus population of 995 manages its water requirements from one open well (dug) and a borewell from rainwater harvesting; Municipal water supply is not sought after at all. Notwithstanding, the college is very much aware and takes many initiatives to avoid water scarcity in the future. As an initiative, rainwater harvesting is the major water conservation activity adopted by the institution. The college management gives due focus on rainwater harvesting activities.

This unit of water functions as a perpetual source of water for the number of toilets and all other activities of the campus. In addition to all these facilities available, the institution has installed a well-maintained water purifying system inside the college campus and canteen which keeps canteen hygiene. Besides, the College has a well-maintained well in the campus which is the prime source of drinking water which has been available to students with a purifying mechanism.

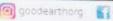
The college has a specific water harvesting system, the total structure of the building is very much suited to preserve water inside the campus. The ground of the institution functions as a key role to preserve rainwater and recharge the above mentioned wells. Instead of concreting, the courtyard of the campus is spread out with bricks and gap between bricks ensures the proper flowing of water down to the ground which also functions as yet another rainwater management system. Above all, various clubs and forums like Nature Club and NSS conduct many programmes and seminars to inculcate the importance of preserving water for a better future in the mind of students.

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Drinking Water Treatment Systems:

In addition to conventional sources of water, the water availability in the campus is augmented by harvesting rainwater from roof-tops. The College has installed a rain water harvesting unit adjacent to the Queen's Park, in the campus which recharges the well after many stages of water filtration.

In our college, the drinking water has been purified by modern treatment technology using Filtration, Ion exchange and Reverse osmosis. There are three R.O. plants are in operation to cater the drinking water needs of all the students, staff members, supporting staff and the visitors.

8. WasteWater Treatment Systems:

Liquid Waste: Effluents from toilet, washing basin and canteen are the major liquid waste in the campus. These are collected in the separate septic pits and allowed to settle into the soil. Since the effluent pits are not located near the water bodies and the college is situated in the soily area, the effluent water gets naturally filtered. The biogas plant is also used for the proper disposal of wastewater.

Observations and area of improvements

College has canopy of trees, garden and lawn in front of the college and there is a huge requirement of water for irrigation. New design of water harvesting system and watering the garden is necessary to keep a check on the amount of water used for gardening like drip irrigation. In campus, small scale / medium scale/ large scale system for reuse and recycling of water is necessary (waste water recycling plants). Less number of leakages was observed while verification and site inspection of infrastructure. However, survey and servicing of water supply lines and appliances are necessary to prevent wastage of water and periodical supervision drills should be arranged. Water supply can be stopped after occupancy time and pressure valves / sensor valves can be used to control overflow. Students should be given awareness to use water judiciously to bring down the wastage of water.

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8.1 Waste Management Audit

Waste Management steps including: Solid waste management Liquid waste management E-waste management

Management of waste is an unavoidable process in the smooth functioning of the Institution. Controlling the generation of waste and the proper disposal or recycling of the waste material is the paramount concern of the College. The College Management along with various clubs like NSS and Nature club accomplish the mission of reducing the generation of waste material on the campus. The generated waste is separated to Solid, Liquid and E-Waste and they are effectively disposed of by the college to make the campus clean and healthy. There are different ways adopted by the college to manage these wastes. They include:

Solid waste: In order to maintain cleanliness and eco-balance the institution always takes various steps to reduce the waste through reuse and recycling. Initiative for paperless office through office automation, consistent efforts to reduce the plastic carry bags, use of public addressing systems and public notice boards help to reduce various forms of solid waste in the campus. All the teachers strictly maintain a software called TCS (Total Campus solution) which remarkably helps to avoid other paperworks like keeping students' attendance, internal marks, student profiles, etc. To preserve campus as a plastic-free zone the institution effectively introduced Green and environment policy and discourages the use of plastic and flex boards in various programs.

Food waste, plastic and papers are the major solid waste materials generated in the college. Under the proper instructions of Nature club student members, the plastic and non-plastic wastes are separately collected by placing different coloured waste bins with separate labels at various locations on the campus. The collected food waste of college canteen is deposited in the biogas plants. As part of Green and environmental policy, the College insists the students bring their lunch in lunch boxes and water in steel bottles so that the piling up of waste paper and plastic can be controlled. In order to reduce the generation of paper waste, the departments promote the submission of assignments online. Wastes like plastic and paper are also sold to scrap dealers.

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E-Waste: Electronic goods are used at its optimum level by proper use and maintenance. Since there is a Department of Computer Science with a computer lab, the institution has a non teaching staff called Technical Assistance whose duty is to ensure the proper maintenance and functioning of computers in all the departments, Offices and Computer Lab. Apart from this, the college also has signed an AMC (annual maintenance contract) with the company, Exxon IT Solutions Which ensures proper installation, maintenance, periodic checking and the proper disposal of non-working electronic items. Thisperiodic checking ensures that non-working or old electronic pieces of equipment are filtered out and disposed-off properly. This contract is renewed every year with proper guidelines. The institution gives much importance to give proper guidelines to students which helps us to keep our electronic goods from damage. The e-Waste which is not accepted by companies are systematically collected and disposed of through scrap dealers by inviting tenders at regular intervals

E-waste 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 Electronic goods are put to optimum use; the minor repairs are set right by the staff and the Laboratory assistants; and the major repairs, by the professional technicians, and are reused. Our College has entered into a contract with Techno Services, an agency at maintenance and disposal of e-wastes, whereby any e-waste if generated will be collected by the agency as per the conditions of the e-waste management ordered by the Government. Thus the burning issue of safe disposal of e-wastes is effectively tackled by the institution. However, the non-functioning instruments bought under various UGC plans could not be disposed in any manners.

9. Observations and area of improvements

Auditing for Green Campus Management

Green Campus is an environment which improves energy efficiency, conserving resources and enhancing environmental quality by educating for sustainability and creating healthy, living and learning environments. Green Campus rewards long term commitment to continuous environmental improvement from the campus community. Green colleges make a point to account for sustainable living when designing and operating their buildings.



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Many of their facilities incorporate natural lighting, improve air quality, and reduce energy and water use. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. Planting trees without consideration for their species, location, and maintenance will not result in all of their wished-for benefits. It is essential to plan where the trees are planted and to plan their ongoing maintenance in order to maximize future benefits and to ensure long-term tree survival and growth. Trees in a college yard improve air quality and can reduce temperatures with their cool shade. They are a small environmental investment that will pay dividends for decades to come. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. So while you are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner for us. Trees on our campus impact our mental health as well;

studies have shown that trees greatly reduce stress, which a huge deal is considering that many students are under some amount of stress.

10. Green Practices

Students, staff using

- a) Bicycles
- b) Public Transport
- c) Pedestrian friendly roads

Plastic-free campus

Paperless office

Green landscaping with trees and plants

Public Transport: Since the college is situated near the national highway, using a bicycle is feasible to both the students and teachers. Therefore, the students are encouraged to use the public transportation system and more than 80% of the students and teachers use public transport facilities for their journey to and from the college. The teaching and non-teaching staffs also adopt a car-pooling system which immensely helps in the reduction of emission of hazardous gasses that negatively affect the environment. A significant number of students from neighboring villages come to College by foot also helps to reduce Carbon FootPrint. Pedestrian Friendly Campus: Since students' vehicles are not permitted in side the compound, The campus remains pedestrian friendly which is strictly monitored by the 24 hours security service at the entrance.

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The institution ensures this environment by providing a separate parking facility for students' vehicles outside the campus which helps to avoid parking their vehicles by the side of the road. The College has pedestrian friendly footpaths inside the campus connecting every building and department.

Plastic-free campus: With the implementation of Green Policy, the campus is declared as a Plastic-free campus. As part of Green Protocol, the College insists the students and teachers bring their lunch in lunch boxes and water in steel bottles so that the piling up of waste plastic can be controlled. To keep this fact in mind, the college keeps steel classes and plates in the college canteen which have been systematically used in all the programmes conducted inside the campus. Both the college and hostel canteens use Steel and glass wares which reduces the plastic waste in the campus. Teachers along with various clubs and forums like Nature club and NSS take all the necessary monitoring to keep the campus a zero plastic zone.

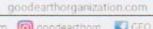
Paperless Office: With the introduction of a software called TCS (Total Campus Solutions) the office is partially declared as 'paperless office'. This was an effective step towards office automation which carries all the student and teacher related records and reports paper free. The the college library is computerised with the OPAC system and E-resources like NLIST available in the library. Most of the communication to staff and students are made through Emails and other digital methods. Public Notice Board at the main block, announcement through Public Addressing system are the other initiatives towards paperless office. Green landscaping with trees and plants:the students and teachers made this campus as green as possible by planting a good number of trees and plants.

11.1 Using Renewable Energy Audit

The main energy source utilized by all the departments and common facility center is common power grid. Total annual energy consumption of the college is 20930.11 kWh/year (1744.18 Units/month) (monthly consumption varies slightly during vacation) during the survey. All the departments and common facility centers are equipped with LED lamps where increased consumption of electricity is observed. About 140 LED lamps are counted during the survey. Electricity consumption showed a rise during summer on account of the hot climate.



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Proper measures have been taken to reduce carbon emission to keep the campus, pollutionfree. Our college is situated in a rural area and very few students use private vehicles. Audit shows that major teaching as well as non-teaching staff in campus and mass number students resort to the public transport system for to and fro transportation. The students are encouraged to use the public transportation system and on an average only 15% of the students use motor bikes or cars as a means of conveyance. The teachers adopt a car-pooling system, also favoring low carbon emission. The College takes conscious efforts to frame policies for energy conservation and maximize renewable energy usage.

11.2 Observations and area of improvements

College has solar panels which power the campus computer lab. But there is a need to extent this facility to more areas and departments. More renewable and carbon-neutral electricity options should be encouraged and supported. Also, the survey has shown that installation of LED lamps throughout the college is a cost and energy efficient practice in the long run. Proper ventilation and air circulation should be ensured in rooms to reduce electricity consumption. Students should be given awareness on maintaining a clean environment and more students should be encouraged to use public transportation.

Overall Suggestions and Recommendations

There exists vast scope to improve the green campus status of the College through biodiversity promotion and tapping green energy sources.

More than 5 acres of land area is available to raise horticulture gardens, fruit- bearing trees and shade-giving trees. About 2000 such trees and 9000 plants shall be raised in the Campus in the next 3 years. Through transplantation of branches from 8-year-old trees, 2,000 trees shall be raised in a year. Within a 6-month period, the Campus will get 2.5-year-old trees numbering 2,000.

Another 15,000 sq.ft. area of lawn shall be raised through the involvement of EcoClub and students from NSS to enhance oxygen emission by another 40%.

Compostable solid waste shall be collected and deposited in solid waste collection tanks. These wastes shall be profitably converted into compost and applied to gardens and trees to reduce the application of chemical-based fertilizers and pesticides.



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Solar panels shall be installed on top of the buildings to produce another 10,000 kW of electricity. To enhance solar power productivity, aluminum foil-based reflectors shall be installed on the eastern and western sides of the solar panel.

Energy-efficient measures such as replacement of all incandescent bulbs with LED lamps, old electrical regulators of fans with energy-efficient electronic regulators, air-conditioning units with all-star rated systems that need to be undertaken.

Students from the Computer Science Department shall be trained as e-waste managers to manage e-waste. These e-managers shall be in constant touch with schools, orphanages and parish houses through social media and inform them of the outdated computer systems that shall be used by them. They also shall dispose of the less efficient, damaged and non-functioning e-wastes to the vendors.

Few more biogas plants shall be installed in the campus using solid waste and night soil generated from the Girls Hostel in the campus. The biogas shall be used by the College canteen.

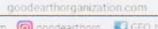
Water quality testing has to be conducted every six month time period in order to check the potability of the drinking water to ensure the students are free from water-borne diseases. All the water taps shall be fitted with high-efficiency aerator taps to reduce wastage of water. All toilets shall be fitted with dual- flush water closets, which will reduce water consumption by 40%.

A separate provision for sharp and glass waste handling has to be established before the designated organizations collect waste from the campus. Personnel who handle these types of sharp/glass waste should be provided with proper personal protective equipment like safety boots and gloves and safety glasses to ensure the work place safety.

Ongoing civil construction and maintenance work in the campus has to be monitored and and controlled systematically to avoid any work place injury to students and staff. Work area should be contained to a separate area to prevent the medical emergency cases. College should also keep and fully functional first Aid box available in at least one in each floor and personal in charge should periodically inspect the first aid box to ensure its availability when in emergency cases. On call doctor availability and an ambulance service also recommended.



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Environment education shall be imparted to all college students through 1-hr life-skill classes once a week. This will create wide-level environment consciousness among the student community. They will be sensitized to encourage pillion riding with their peers or use public transport instead of two wheelers. Moreover, they will also motivate their parents to replace all the incandescent or fluorescent bulbs with energy-efficient LED bulbs.

12. Some action plan Recommendations

Water

- Remove damaged taps and install sensitive taps is possible.
- Drip irrigation for gardens and vegetable cultivation can be initiated.
- Establish rain water harvesting systems for each building.
- Awareness programs on water conservation to be conducted.
- Install display boards to control the exploitation of water.

Energy

- Employment of more solar panels and other renewable energy sources.
- Conduct more safe energy awareness programs for students and staff.
- More energy efficient fans should be replaced.
- Observe a power saving day every year.
- Automatic power switch off systems may be introduced.

Waste

- Establish a more functional bio gas plant.
- A model solid waste treatment system to be established.
- Practice of waste segregation to be initiated.
- A model Vermicomposting plant to be set up in the college campus.
- Avoid paper plates and cups for all functions in the college.





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Green Campus

- All trees in the campus should be named scientifically.
- Create more space for planting.
- Create an automatic drip irrigation system during summer holidays.
- Not just celebrating environment day but making it a daily habit.
- Beautify the college building with indoor plants
- Providing funds to nature club for making campus more green
- Encouraging students not just through words, but through action for
- · making the campus green.
- Conducting competitions among departments for making students
- more interested in making the campus green.

Carbon footprint

- Establish a system of car pooling among the staff to reduce the number
- of four wheelers coming to the college.
- Encourage students and staff to use cycles.
- Establish a more efficient cooking system to save gas in the canteen
- Discourage the students using two wheelers for their commutation.
- More use of generators every day should be discouraged.

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