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SIGNIFICANCE OF GREEN AUDIT AND GREEN CAMPUS FOR OBTAINING THE NAAC ACCREDITATION

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ABSTRACT

Green campus is not only the must requirement for the educational institution on ground reality but it is also mandatory according to the National Assessment and Accreditation Council (NAAC) guidelines. The requirement and modes of the green campus can be fulfilled by the green audit. Green Audit is a comprehensive tool for evaluating the environmental performance of the organizations, including its impact on natural resources, waste generation, and energy use which helps to identify and assess the impact of its operations on the environment. In the higher education domain, Green Audit has gained significant importance, especially during the NAAC grade inspection. The National Assessment and Accreditation Council (NAAC) is a body that assesses the quality of higher education institutions in India and with the increasing concern for environmental protection, institutions are now required to conduct green audits to assess their environmental impact.

The present study uses a descriptive research design to examine the relationship between green auditing and NAAC grade inspection. The data was collected from various sources, including published literature, case studies and surveys. The findings of the study reveal that green audit plays a vital role in obtaining higher grade in NAAC inspection. The paper presents a detailed analysis of the NAAC grading system, the importance of green audits, the green audit process in higher education institutions, the benefits of implementing sustainable practices in higher education institutions. The paper also presents case studies of institutions that have successfully obtained higher NAAC grades through the implementation of green audit practices.

Keywords: Green Audit, Green Campus, NAAC Grade Inspection, Environmental Sustainability, Higher Education Institutions, Accreditation

1. INTRODUCTION

Environmental sustainability is a critical issue in today's world, and educational institutions have a significant responsibility to address this concern. Educational institutions are among the most significant social institutions that shape future generation's values and behavior. In this regard, green auditing has become an essential tool for colleges and universities to assess their environmental performance and ensure sustainable practices.

The green audit is the process of evaluating an organization's environmental impact and assessing its compliance with environmental regulations and standards. Educational institutions can use green auditing to evaluate their environmental impact and identify areas where improvements can be made to minimize environmental damage and increase sustainability. Moreover, green audits can help educational institutions achieve a higher NAAC grade, which is crucial for their reputation and quality benchmark.

NAAC accreditation is required for all higher education institutions, including central universities, state universities, deemed universities, and private universities. Universities that do not have NAAC accreditation are ineligible for UGC grants, and other financial assistance available to higher education institutions. NAAC accreditation, on the other hand, assesses the quality of a higher education institute in terms of education facilities provided in the institution, teaching quality, infrastructure availability, research facilities available and its quality, and so on. Institutes with higher NAAC ratings A^{++}, A^{+}, and A are among the most desired since they provide high-quality education and research facilities. After completing the first or second year of study, all UGC-recognized institutions must apply for any of the accreditations such as NAAC, NBA, BCI, MCI, DCI, PCI, UGC, AICTE, and so on. The National Assessment and Accreditation Council (NAAC) is an autonomous body that assesses and accredits higher education institutions in India. NAAC's accreditation process is based on several parameters, including institutional quality, curriculum, teaching, research, infrastructure, student support, and governance. In recent years, NAAC has also included a parameter for environmental performance in its accreditation process.

One of the key criteria for NAAC evaluation is sustainability, which refers to the ability of educational institutions to promote environmental, social, and economic sustainability. In recent years, there has been an increasing focus on sustainability in NAAC inspections, with a growing emphasis on promoting green campuses and green practices, and reducing the carbon footprint of educational institutions. Therefore, it has led to the emergence of green audits as an important tool for educational institutions to meet NAAC requirements, and are more likely to receive a higher NAAC grade.

2. THE NAAC GRADING SYSTEM

The NAAC grading system is based on a set of parameters that evaluate the overall performance of the institution. The grading system is divided into seven criteria, namely, curricular aspects, teaching-learning and evaluation, research, innovation and extensions, infrastructure and learning resources, student support and progression, governance, leadership and management, and innovation and best practices. Each criterion is further divided into sub-criteria, and the institution is evaluated on a scale of A to C, with A being the highest grade. The green audit falls in the 7^{th} criterion of NAAC inspection. Generally, 20 criteria are considered for the green campus which are as follows- rainwater harvest, terrace farming, neutralization tank for wastewater from the chemistry lab, zero liquid discharge, hazardous and e-waste, paperless office, fire and safety, wealth from waste, green curriculum, internal revenue generation, the ban on plastic, environmental education, energy efficient electrical and electronic appliances, internal carbon trade, environmental self-audit, vermicompost, DG set air pollution, noise pollution as per CPCM, MoEF, GoI. Isopleths are drawn by students, green building concepts, report on biodiversity

3. LITERATURE REVIEW

The literature review examines the previous research conducted on the importance of green audit in achieving environmental sustainability and obtaining higher grades in NAAC grade inspection. The green audit provides several benefits for educational institutions. It helps institutions to identify opportunities to reduce their energy consumption and waste production, which can lead to significant cost savings. Green audit also promotes sustainability and environmental awareness among students and staff. Moreover, it enhances the reputation of the institution by demonstrating its commitment to sustainability.

The relationship between green audit and NAAC grade inspection is significant. Educational institutions that conduct green audits and implement sustainable practices are more likely to obtain a high grade in NAAC inspections. Green audit not only helps higher education institutions to meet the sustainability criteria but also reduced their expenditure, which can further lead to higher NAAC grades. Several studies have shown that green audit plays a significant role in improving the environmental performance of higher education institutions and obtaining a better NAAC grade in the inspection. The following paragraphs provide a review of some of the relevant literature on this topic.

A study by Ramesh & Kumar (2015) found that green audit played a crucial role in improving the environmental performance of higher education institutions in India. The study analyzed the implementation of Green Audit in six higher education institutions and found that the audit helped the institutions to identify areas for improvement and implement corrective actions to enhance their environmental performance. The study concluded that green audit was an effective tool for higher education institutions to enhance their sustainability practices and establish their quality and credibility in the education sector.

A study by Sowjanya & Srinivas (2017) analyzed the impact of the green audit on the environmental performance of higher education institutions in India. The study analyzed the implementation of Green Audit in eight higher education institutions and found that the audit helped the institutions to reduce their energy consumption, water consumption, and waste generation. The study also found that the implementation of Green Audit helped the institutions to comply with environmental regulations and enhance their social responsibility towards the community. The study concluded that Green Audit was a crucial tool for higher education institutions to improve their environmental performance and obtain a better NAAC grade inspection.

A study by Rajkumar and Gnanavelraja (2018) analyzed the implementation of Green Audit in a higher education institution in India and found that the audit helped the institution to reduce its energy consumption by 20%, water consumption by 30%, and waste generation by 40%. The study also found that the implementation of Green Audit helped the institution to comply with environmental regulations and enhance its sustainability practices. The study concluded that Green Audit was a powerful tool for higher education institutions to improve their environmental performance and obtain a better NAAC grade inspection.

4. OBJECTIVES

The main objective of this research paper is to examine the importance of green audit in obtaining a high grade in NAAC inspections. The study aims to achieve the following specific objectives:

- To understand the concept of green audit and its objectives
- To examine the importance of green audit in NAAC inspection
- To developed the process of green audit in higher education institutions
- To identify the benefits of green audit for educational institutions
- To identify the challenges faced while conducting green audit in higher education institutions and solutions for the same
- To analyze the relationship between green audit and NAAC grade inspection

5. METHODOLOGY

The research methodology for this study includes a combination of primary and secondary sources. The primary sources include interviews with experts in the field of sustainability and NAAC inspections. The secondary sources include literature reviews, case studies, and reports on green audit and NAAC inspections. The study also utilizes a qualitative research approach, as it seeks to understand the subjective experiences and perceptions of educational institutions regarding green audit and NAAC inspections. The research methodology involved the following steps:

- **Identification of relevant literature -** A systematic search of academic databases such as Google Scholar, Web of Science, and Scopus was conducted to identify relevant literature related to Green Audit in higher education institutions.
- **Selection of articles -** The articles were screened based on their relevance, quality, and applicability to the research objectives. The selected articles were included in the literature review.
- **Synthesis of literature -** The literature was synthesized to develop a comprehensive guide on how to perform Green Audit in higher education institutions.

Figure 1

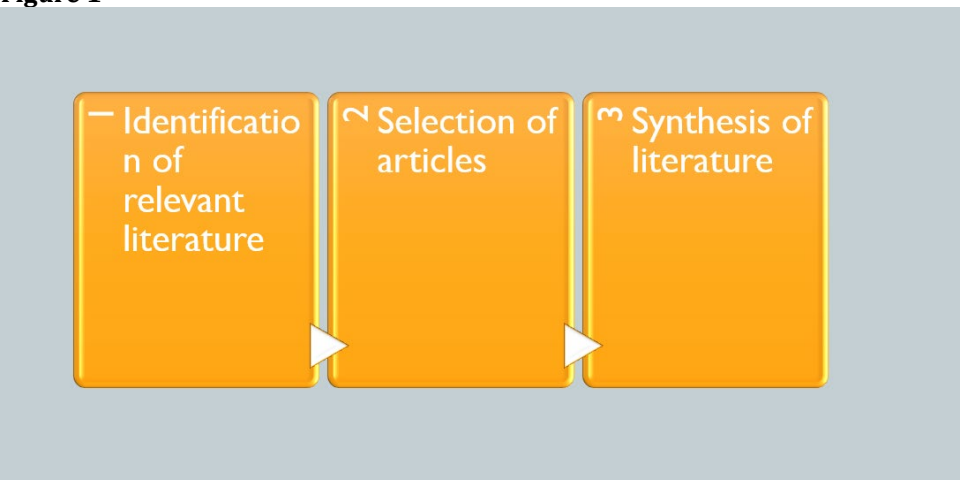

Figure 1 Green Audit Process in Higher Education Institutions.

Importance of Green Audit in NAAC Grade Inspection:

The green audit is becoming increasingly important for higher education institutions as it helps to evaluate the environmental performance of the institution. The audit covers various aspects such as audit for water management, audit for

energy management, audit for waste management, and audit for green campus biodiversity, flora and fauna. The audit helps to identify areas where the institution can improve its environmental performance and implement sustainable practices. Implementing sustainable practices not only helps to reduce the environmental impact of the institution but also helps to reduce operating costs. The following are the importance of green audit in getting NAAC grade inspection.

- **Environmental Sustainability -**The green audit helps institutions to ensure environmental sustainability. It identifies areas where the institution can reduce energy consumption, minimize waste generation, and conserve natural resources. Institutions that demonstrate a commitment to environmental sustainability are more likely to receive a higher grade from NAAC.
- **Compliance with Regulations -**The green audit helps institutions to comply with environmental regulations. The audit assesses an institution's compliance with environmental laws and regulations, such as waste management rules, water conservation, and energy conservation measures. Institutions that demonstrate compliance with environmental regulations are more likely to receive a higher grade from NAAC.
- **Cost Savings -** The green audit helps institutions to reduce costs associated with energy consumption and waste generation. The audit identifies areas where the institution can reduce its energy consumption and minimize waste generation. Institutions that implement the audit's recommendations can reduce their operating costs and improve their financial performance, which can contribute to a higher grade from NAAC.
- **Promote Positive Image -** Institutions that demonstrate a commitment to environmental sustainability through green audits are more likely to have a positive image in the community. A positive image can contribute to higher enrollment, improved funding, and a better reputation, which can contribute to a higher grade from NAAC.

Figure 2

Figure 2 Importance of Green Audit in Getting NAAC Grade Inspection

Green Audit Process in Higher Education Institutions

Generally, there are three steps involved in the process of green audit in the higher education institution

Establishing the Green Audit Team – This is the primary step of conducting green audit in any higher educational institutions.

- The first step in performing green audit is to plan the audit and establish a green audit team comprising representatives from various departments, including administration, faculty, students, and staff.
- The team should have a clear understanding of the institution's environmental sustainability goals and objectives.
- There should be a separate audit to conduct for UG, PG, labs, auditorium, theatres of lectures, classrooms, washrooms, common rooms, sports complex and ground, library, vehicle stands, museum, medical center, boundary walls, staff rooms, different committees offices, academic and administrative section, security rooms, hostels, garden and plants, cafeteria and canteens, water points, solar and electric panels, waste management system etc.

Conducting A Baseline Assessment and Site visit - The Green Audit team should conduct a baseline assessment to evaluate the institution's current environmental performance. The assessment should cover various areas such as energy consumption, water usage, waste management, transportation and total footfall. Visiting the site is the actual process of collecting the primary and secondary data by recording or observing.

- It should be done in day-to-day basis so one can mark it in academic calendar.
- Analyzing the strength or weakness of the IQAC of the academic institution is very important.
- The assessment should cover various areas such as energy consumption, e-waste, water usage, waste management, transportation and total footfall and carbon footprints etc.
- Evaluation the data collected from various sources by performing observation and recording.
- Intellectual audit that complies the various publication such as research paper, articles, magazines, book chapters, books, monographs etc.
- Side by side prepared the report of all the recordings and observations.

Preparing the Audit Report – it includes drafting, identifying the area of improvements, implementing correction plans and monitoring and evaluation

- Draft report is generated by a proper analysis of the primary and secondary data.
- Financial report is generated by analyzing the data statistically.
- Based on the baseline assessment and report, the Green Audit team should identify areas for improvement and prioritize them based on their impact and feasibility. The team should set specific, measurable, achievable, relevant, and time-bound (SMART) targets for each improvement area.
- Final report of audit is sent to the management in case of private and deemed university and to government in case of central or state university.
- The Green Audit team should continuously monitor and evaluate the implemented corrective actions to assess their effectiveness and identify any gaps. The actions may include energy-efficient practices, waste reduction, water conservation, and sustainable transportation The team should also prepare a sustainability report that includes the institution's

environmental performance, progress towards the set targets, and recommendations for future improvement.

Figure 3

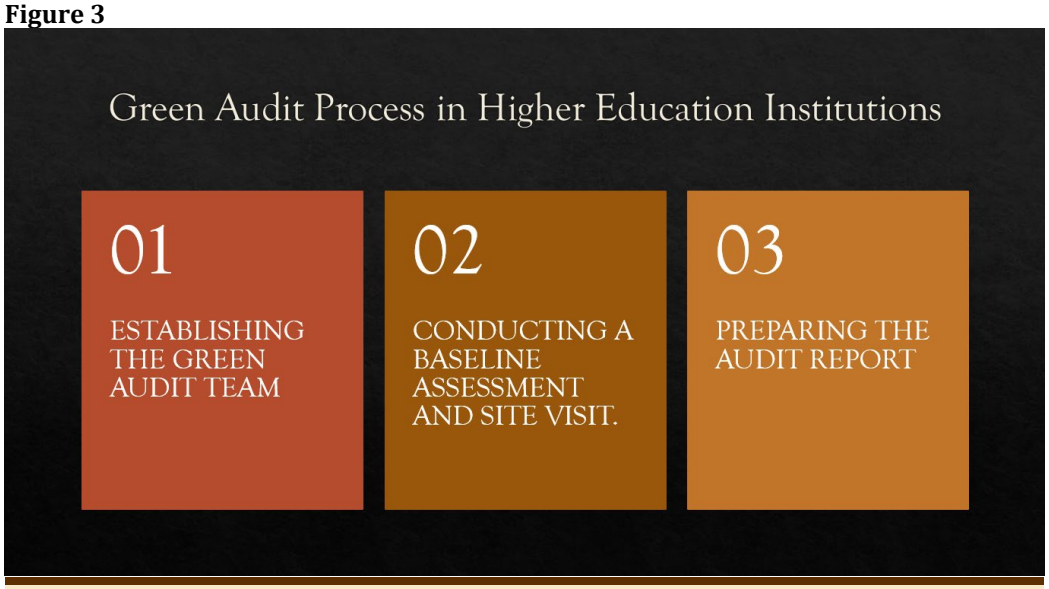

Figure 3 Green Audit Process in Higher Education Institutions

Tentative draft of audit for water management, energy management, waste management, green campus biodiversity, floral and faunal and carbon foot print

Out of the twenty green campus criteria, a preliminary draught of five green campus criterion is presented below. Higher education institutions in India can use any of the twenty criteria of the green campus, but it is not possible to work on all twenty criteria at the same time, so it is recommended that these twenty criteria should be divided and worked on year by year after filling the gap of the previous year used criteria.

Audit for Water Management
What are your institution's water sources?
How many wells does your institution have?
How many water pumps are required to extract water from each well?
How much horsepower does each water pump have?
How many water storage tanks do you have in your institution?
How much water is pumped per day?
How much water is kept in the overhead water tank? (Amount in liters)
Provide a detailed list of your institution's water usage.
Is there any waste of water? If so, please provide the proper rationale.
How can you avoid this waste?
Where does waste water originate?
What happens to the wastewater?
How is wastewater used in your institution?
How do you handle the water in your laboratories? Is it contaminated with groundwater?

How does your institution conduct treatment for the lab water?
Did your institution apply the green chemistry procedures in labs?
How many water coolers are installed in your institution. Amount of water used per day? (In liters)
How many water taps were installed (Bathrooms, common, garden, canteen, labs and hostels) in your institution? How much water does your institution use per day?
List down the methods that might help lower the quantity of water used in your institution.

Audit for Energy Management

Particulars		Value
1.	Give a list of your institution's energy use. (Electricity, solar, gasoline, diesel, firewood, and so forth)	xxxx
2.	Last year's electricity bills (Monthly bills for one year)	xxxx
3.	The number of LPG cylinders consumed at the institution and the price paid in Rs.	xxxx
4.	The weight of the firewood and the sum paid in Rs.	xxxx
5.	Amount spent on solar panel maintenance	xxxx
6.	Do you utilize any energy-saving techniques in your institution? If so, please list them. If not, make some suggestions.	xxxx
7.	How much money is spent each month on energy (Electricity, solar, gas, firewood, etc.)? (Give a one-year record of monthly spending.)	xxxx
8.	How many CFL/LED/incandescent bulbs have you installed in your institution? Noted its use (Hours used/number of days in a month)	xxxx
9.	How much electricity is used per month by each CFL/LED/incandescent bulb? (In kwh)	xxxx
10.	How many CFL/LED tube lights have you installed in your institution? Noted its use (Hours used/number of days in a month)	xxxx
11.	How much electricity is used per month by each CFL/LED tube light? (In kwh)	xxxx
12.	How many water coolers have you put in your institution? Noted its use (Hours used/number of days in a month)	xxxx
13.	How much electricity is used by each water cooler each month? (In kwh)	xxxx
14.	How many ceiling fans have you installed in your institution? Noted its use (Hours used/number of days in a month)	xxxx
15.	How much electricity is utilized by each ceiling fan every month? (In kwh)	xxxx
16.	How many air conditioners/ air coolers have you placed in your institution? Noted its use (Hours used/number of days in a month)	xxxx
17.	How much electricity is utilized by each air conditioner/ air cooler each month? (In kwh)	xxxx
18.	How many refrigerators have you put in your institution? Noted its use (Hours used/number of days in a month)	xxxx
19.	How much electricity does each refrigerator consume every month? (In kwh)	xxxx
20.	How many water pumps have you installed in your institution? referred to the usage of (Hours used/number of days in a month)	xxxx
21.	How much electricity is used by each water pump per month? (In kwh)	xxxx
22.	How many computers/photocopiers/printers do you have in your institution? Noted its use (Hours used/number of days in a month)	xxxx
23.	How much electricity does each computer/photocopier/printer consume every month? (In kwh)	xxxx
24.	How many pieces of electrical equipment have been installed in your institution's various labs? Noted its use (Hours used/number of days in a month)	xxxx

25.	How much electricity is used by each piece of electrical equipment per month? (In kwh)	xxxx
26.	How many street lights do you have in your institution?	xxxx
27.	How much electricity is utilized by each street light every month? (In kwh)	xxxx
28.	How many TVs are there in your institution and hostels?	xxxx
29.	How much electricity does each TV consume every month? (In kwh)	xxxx
30.	Is there any other electrical equipment in your institution?	xxxx
31.	How much electricity is utilized by the remainder of the electronic equipment each month? (In kwh)	xxxx
32.	Are you conducting a switch-off drill at your institution?	xxxx
33.	Are your computers and other electronic devices set to power-saving mode?	xxxx
34.	Do your TV, air conditioner, PCs, printers, and so on spend the majority of their time in standby mode? If so, how long will it take? (In Hrs.)	xxxx
35.	What energy-saving measures has your institution implemented?	xxxx
36.	How many billboards promote energy conservation?	xxxx
37.	Make a list of ways your institution may lower its energy use in the future.	

Audit for Waste Management

Particulars		**Value**
1.	Total no. of students and teachers in your institution (Approx.)	xxxx
•	Total students	xxxx
•	Total academic staff	xxxx
•	Total non- academic staff	xxxx
•	Total no. of male	xxxx
•	Total no. of female	xxxx
2.	Which of the following facilities available in your institution? (Provided the numerical value of each)	
•	Number of class rooms	xxxx
•	Number of office room (Specify each)	xxxx
•	Number of canteens	xxxx
•	Number of vehicles shed areas	xxxx
•	Number of kitchens	xxxx
•	Number of laboratories	xxxx
•	Number of sports areas	xxxx
•	Number of Toilets	xxxx
•	Number of garbage dumping areas	xxxx
•	Number of gardens	xxxx
3.	Which of the followings are situated near your institutions? (tick)	
•	Municipal dumping yard	Yes/ No
•	Sewer line/ open drainage	Yes/ No
•	Trash dumping	Yes/ No
•	Public convenience	Yes/ No
•	Industry	Yes/ No

• Bus stop/railway station/metro station/market/shopping marts/public halls	Yes/ No
4. Is there any waste at your college? If it is then, specify the type of garbage (E-waste, hazardous waste, solid waste, dry leaves, canteen waste, liquid waste, glass, unused equipment, medical waste, tissue paper, etc.) and the volume.	
5. Is the institution equipped with a waste treatment system or plant?	
6. Is it possible to treat toilet/urinal/sanitary napkin wastages in your institution?	
7. How much garbage (In office, labs, kitchen and canteen) is produced each day? (Measured in kilograms)	
8. Is garbage damaging the institute's groundwater and air? If that's so, how?	
9. How is waste management handled at the college? Methods\s (Reusing, Decomposition, Recycling and Others)	
10. How many distinct garbage collection boxes do you believe would be required in a classroom to begin a trash sorting and recycling campaign? What should each box be used for? (Create a color theme with justifications.	
11. Can you reach zero waste in the institution? (Decrease, Recycle, Reuse, and Discard) If so, how?	

Audit for Green Campus Biodiversity, Floral and Faunal
1. Is there any garden developed in your institution? If yes, provide the area.
2. Do students spend their time in the garden?
3. Make a list of plants using their botanical name in the garden, (approx.). Quantity of plants with the name of species.
4. Suggest plants (botanical name) for your institution. (Include vegetables, herbs, etc.)
5. Provide the number and species planted by the students.
6. Do you display the scientific name of the plants and trees in your institution?
7. Is there any plantation happened in your institution? If yes, specify the area and kind of plantation.
8. Is there any vegetable garden in your institution? If yes, how much area?
9. Is there any medical garden in your institution? If yes, how much area?
10. Which type of vegetables are cultivated in your vegetable garden? (how much does your institution harvest in each season)
11. How much water is used in your institute's gardens?
12. Who is in-charge of gardens in your institution?
13. Is your institute use any type of recycled water in the garden?
14. List down the name and quantity of pesticides and fertilizers used in your institution's gardens?
15. Are doing any organic farming in your college? How?
16. Do you have any composting pits in your college? If yes How is the compost used?
17. How many acres of campus is covered by trees? in the shade of a tree?
18. Share your thoughts on improving the green cover.

Audit for Carbon Footprint
1. How many students and professors are there in your institution? (Including the total number of students, academic staff, non-academic personnel, and male and female staff.)
2. Overall number of automobiles on the campus of the institution (Per day).
3. Number of bicycles used in the institution?

4.	How many two-wheelers/cars are used at the institution? (Average distance traveled, the amount spent on fuel, and the amount consumed every day)
5.	How many persons used the public transportation/institution's conveyance service? (Average distance traveled, the amount spent on fuel, and the amount consumed every day)
6.	How many visitors with automobiles arrive each day? (Cars, motorcycles, etc.)
7.	How many parent-teacher meetings are there in a year? Parental outcome (Approx.)
8.	Amount paid for taxi/auto charges, amount of fuel used per month for transit of veggies and other supplies to the cafeteria or department goods to the institution?
9.	Amount paid for taxis/cabs/ e-rickshaw monthly by the stakeholders of the institution?
10.	Use of any other carbon fuels in the college? (Amount spent on fuel, and amount consumed every day)
11.	Suggest ways to reduce the fuel consumption of stakeholders/ students/ professors/ non-academic staff of the institution.

Benefits of Implementing Sustainable Practices:

Implementing sustainable practices in higher education institutions has several benefits.

- First, it helps to reduce the environmental impact of the institution.
- Second, it helps to reduce operating costs, as energy and water consumption are reduced.
- Third, it helps to create a culture of sustainability within the institution, and students are exposed to sustainable practices, which they can implement in their personal lives.
- Fourth, it promotes the better image of the higher educational institution and helps in building a good relationship with the stakeholders.
- Fifth, it opens the door to research and development-based opportunities in areas like water management, waste management, and the impact of carbon footprint in local environmental conditions.
- Sixth, it provides the opportunities to teach and demonstrate the cause-and-effect relationship of various items, activities and living beings in the environment.
- Finally, implementing sustainable practices can help institutions to obtain higher NAAC grades.

6. CASE STUDIES

There are several case studies of institutions that have successfully obtained higher NAAC grades through the implementation of green audit practices. The University of Hyderabad implemented several sustainable practices, such as rainwater harvesting, solar water heating, and energy-efficient lighting, which helped the institution to obtain an A+ grade from NAAC. The Indian Institute of Management (IIM), Ahmedabad, implemented several sustainable practices, such as energy-efficient buildings, water conservation, and waste management, which helped the institution to obtain an A++ grade from NAAC.

7. CONCLUSION

In conclusion, the green audit is becoming increasingly important for higher education institutions to demonstrate their commitment to sustainable practices.

The audit helps to evaluate the environmental performance of the institution and identify areas where the institution can improve its environmental performance and implement corrective actions to enhance it sustainability practices. Enhancing sustainable practices not only helps to reduce the environmental impact of the institution but also helps to reduce operating costs and improve its public image. Institutions that implement sustainable practices can obtain higher NAAC grades, as seen from the case studies presented in this paper, which is crucial for establishing their quality and credibility in the education sector. Therefore, it is important for higher education institutions in India to implement green audit practices and incorporate sustainable development practices in their operations to enhance their environmental performance and credibility.

CONFLICT OF INTERESTS

None.

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None.

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