



GREEN AUDIT IN ACADEMIC INSTITUTES

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Abstract

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. In Indian scenario, very few industries were inspired. The reasons are listed in the present study. The present study focuses on the process of environmental audit in academic institutes of India. The study also mentions some of the practices to be continued as a part of environmental management. Some of the practices like renewable energy, composting, use of CFL are followed by 60%, 50% and 30% of the institutes respectively. Sewage treatment plants are opted by only 20% institutes. It is found that there is meagre data is available regarding the environmental practices undertaken by the academic institutes. Such data may help in deciding the simple policies to be adapted by the institutes towards a sustainable environment.

Key words: Stages of Audit, Energy Management, Water Management, Plantation, Biogas Plants

Introduction

Earth is the only planet in the universe to sustain life because of its environment. No life can exist without suitable environment and so no human being. Increasing population, civilization, industrialization and urbanization on the earth have brought this environment under the great pressure. Revolution in the field of science and technology to make the life more comfortable has made the environmental degradation as transboundary problem which has degraded air, water, soil and ecosystem as whole. Polluted environment leads to the adverse effects on the health of animals, plants and human being. Booming technological



fight in the past decade has affected environment very adversely. Environmental issues have now become a world-wide concern and the focus of discussion in a variety of forums both at national and international levels.

India is a developing country and adapting science and technology for its progression. There is improvement in the life style but on the other side it is creating exploitation of the environment. Luxurious life style is becoming environmental risk which may render it unsuitable for future generation.

All the issues related to environment are rooted in economic and social policies of the country and therefore they occur at all levels from local, national to global. Most of the foreign countries are working on these issues sincerely and systematically. They have framed very stringent policies for environment protection and executed them successfully. Even the country like Maldives called attention of the world by convening its meeting of cabinet under the sea. However, besides having tradition of worshipping environment, we, Indian are overlooking the challenging and burning issues of environmental protection. Environmental issues remained just part of the debate and discussion but rarely any action is taken in systematic way. It is assumed by the society that the responsibility of protection of environment lies with government and its concern agencies. Even majority of industries in India are focusing on their production and marketing policies but not on the control of environment hazards that they are being responsible.

Generally, every constituents of our society is responsible for environment crises and it is the duty of each of us to strive hard for its conservation. If we start with ourselves, it will definitely create a positive benchmark of the success in the journey of environment protection. Green audit is the prime solution of this scenario.

Green audit is the tool of management system used methodologically for protection and conservation of the environment. It is also used for the sustenance of the environment. The audit suggests different standard parameters, methods and projects for environmental protection. It can be adopted by any industry, organization, institute and even by housing complex. The green audit is useful to detect and monitor sources of environment pollution and it emphasizes on management of all types of wastes, monitoring of energy consumption, monitoring of quality and quantity of water, monitoring of hazards, safety of stakeholders and even the management of disasters.

Background

The green audit was first implemented in the United States in the early 1970s by some companies in commensuration with Clean Air and Clean Water Act. The process of this audit initiated from response of commercial policies of US to natural requirement and not from the local authorities. Afterwards, these policies



resulted into an act for the companies who are responsible for environmental loss that they were causing. The US has adopted the act to compensate the environmental loss. In order to avoid this liability companies took initiatives with regards to act by conducting 'Performance Review' and 'Compliance Audit'.

In UK, a few major companies mainly the British Petroleum introduced guidelines of environmental auditing for the first time in 1975. It was then made applicable to local authority sections in this country when 'Environmental Charter for Local Government of the Friends of the Earth' came in light in the year 1989. By 1992, more or less half of the local authorities of UK stood for the audit completely or partially.

The United Nations Conference on Environment and Development (UNCED), also known as Earth Summit Rio-1992 held at Rio de Janeiro, Portuguese from 3rd to 14th June 1992 inspired the countries on the globe to review their environmental stand to act effectively to save the earth with sustainable approach. It is the best achievement of the Earth Summit Rio-1992 that most of the countries have accepted their national strategy for sustainable development which includes the policy and programmes aimed to promote geo-biodiversity and protect environment. This Rio spirit shows significant progress in most of the countries and they have changed and upgraded the environmental situation to the possible extent. Some of the Asian countries were also motivated from the summit and played same role within their limits.

India is the first country in the world to make environmental audit compulsory (Arora 2017). According to gazette notification [No. GSR 329 (E)] of March 13, 1992, all Industries were communicated to submit the reports of the environmental audit to their concerned State Pollution Board, giving details of water, raw materials and energy resources used and products and waste generated by them in their operations from 1992 (National Environmental Policy 2006).

The environmental audit could not make much headway even after two years. Out of the lakhs of industries that existed in India, only 2995 audit reports were submitted by December 1993 (Aparajita 1995). The possible reasons would be

1. Hurriedly implementation without any infrastructure or experts.
2. Higher cost for environmental auditing.
3. Longer period of completion.
4. No follow up plans.
5. No evaluation of the reports by concerned PCBs and no feedback provided.
6. Fear among industries about disclosure of modus operandi to the public who they feel are not mature enough to follow the importance of such data.
7. Fear among industrialist that the data they are revealing might lead to legal arguments and litigation by PCBs.



8. There was also fear among the industrialists that the data regarding raw materials used which was supposed to be mentioned by industries might reveal their trade secret.

This has led to distortion of environmental audit and the revised notification No. GSR 386 (E) was announced in April 22, 1993. It has replaced 'Environmental Audit' by 'Environmental Statement'. The Government of India has announced the policy statement: 'Industrial concerns and local bodies should feel that they have a responsibility for abatement of pollution.' The industries were now supposed to fill a form and submit it to the concerned Pollution Control Boards (PCBs). The environmental statement was not actual based on actual reports and was stating that the concerned industry has taken requisite steps in compliance with existing pollution control regulations. It defeated the purpose of environmental audit regulation.

Environmental Audit in Academic Institutes

In 2006, Government of India has declared the National Environment Policy 2006 and made green audit mandatory to each industry. According to the policy it is a response to India's national commitment to a clean environment, mandated in the Constitution in Articles 48 A and 51 A (g), (DPSP) strengthened by judicial interpretation of Article 21 (National Environmental Policy 2006). It is recognized that the maintenance of the healthy environment is not the responsibility of the state alone. It is the responsibility of every citizen and thus a spirit of partnership is to be realized through the environment management of the country. The process of environmental audit was formalised by Supreme Audit Institution (SAI) according to the guidelines given in Manual of Standard Orders (MSO) issued by Authority of the Controller and Auditor General of India 2002. . The Supreme Audit Institution of India is the highest national Institution of auditing in the country.

By realizing the need of responsibility towards environment, NAAC, an autonomous body under UGC has added the concept of environmental audit in accreditation methodologies of universities and colleges.

Aims and objectives of Environmental Audit in Academic Institutes

To nurture environmental friendly management in academic institutions following aims and objectives were formulated

- To recognize the initiative taken by organization towards environment.
- To secure the environment and cut down the threats posed to human health.
- To provide baseline information to enable organization to evaluate and manage environmental change, threat and risk.
- To recognize, diagnose and resolve the environmental problems.
- To recognize the effects of an organization on the environment and vice versa.



- To identify and control the impact of activities of organizations on environment.
- To suggest the best protocols for sustainable development organization and environment.
- To assess environmental performance and the effectiveness of the measures to achieve the defined objectives and targets.
- To identify the different pressures on organizations to improve their environmental performance.
- To ensure that the natural resources are utilized properly as per national policy of environment.
- To establish the parameters for maintaining health and welfare of the community of the organization.
- To set the procedure for disposal of all types of harmful wastes.
- To reduce energy consumption.
- To give preference to the most energy efficient and environmentally sound appliances.
- To minimize the consumption of water and monitor its quality.
- To identify the risks of hazards and implement the policies for safety of stakeholders.
- To facilitate the stakeholders with different aspects of disaster management.
- To train all stakeholders of the organization and empower them to contribute and participate in the environmental protection.
- To make sure that rules and regulations are taken care to avoid the interruptions in environment.

To achieve the mentioned objectives following stages are implemented. It includes three stages viz. pre-audit stage, audit stage and post-audit stage. Each of these stages comprises a number of clearly defined objectives, with each objective to be achieved through specific actions and these actions yielding results in the form of outputs at the end of each stage.

Keeping the importance of environmental audit in view, the present study focuses on reviewing the process of environment audit and the major to be taken by academic institutes to contribute towards environment.

Research Methodology

For the current study, the secondary data is used. It is obtained from the environmental audit reports of colleges across India. The primary data regarding some of the environmental related practices was also generated through secondary sources. Institutions related to higher education are only considered during the present study.

Pre-audit Stage

- **Establishment of Environmental Management System**

The first and very important phase of green audit is establishment of an Environmental Management System (EMS) by an organization. The Environmental Management System is the backbone of the auditing process and its role is broad and wide. Every aspect of green audit is monitored by this system. The organization should establish the Environmental Management System. The governance structure of the Environmental Management System is shown in following chart.

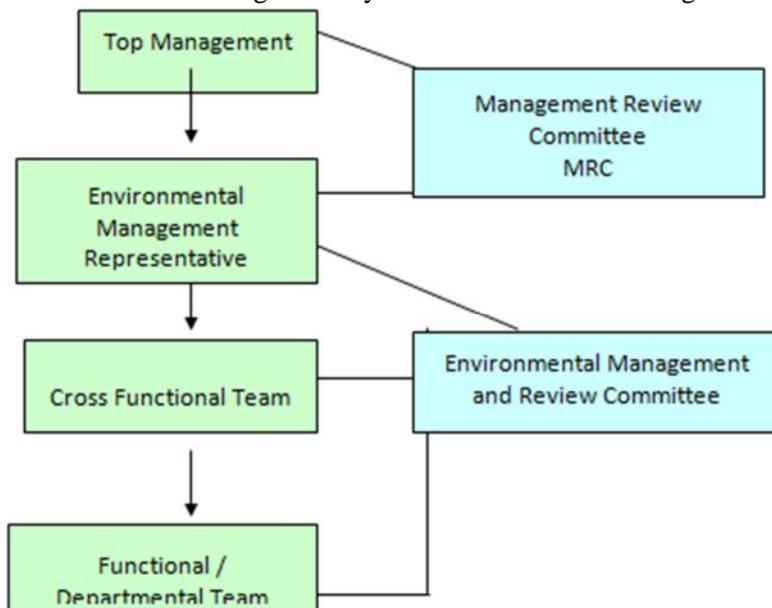


Fig. 1 Governance of Environmental Management

Environment Management System includes all stakeholders of an organization comprising top management to the functional team. Each of them has given a specific task of compliance within stipulated period.

- **Declaration of Environmental Policy**

The Environment Management System should declare ‘Environment Policy of an Organization’ and communicate it to all the concerns stakeholders. The policy is the reflection of goals, objectives, scope and priorities of the organization related to environment sustenance.

- **Planning of Programmes or Activities**

As per the declared environmental policy, the Environment Management System should plan and execute their programmes and activities in comprehensive and



systematic manner. All environmental aspects related to the organization and their legal requirements should be studied before the planning of such activities.

- **Implementation and Operations**

During implementation and operation processes the EMS requires to define roles, responsibilities and authorities of key personnel, commit to staff training, maintain effective communication channels, adopt effective documentation and operational controls and maintain sufficient awareness on emergency preparedness among the staff.

The EMS should evaluate all implemented programmes and processes and modify it as per the environment policy.

Audit Stage

- **Actual Auditing**

The Environment Management System plans and executes the actual visit of an auditor of concerned agency.

- **Checking of Documents and Evaluation**

The auditor evaluates the documents rigorously and suggests necessary recommendations.

- **Review of Environment Policy**

The auditor takes the review of the Environment Policy by evaluation of documents as well as personal interviews of representatives of stakeholders.

- **Review of Programmes or Activities**

The auditor also takes the review of all the planned and implemented programmes or activities by evaluation of documents as well as personal interviews of representatives of stakeholders.

Post-audit Stage

The post-audit stage is the role of an auditor. The auditor considers all the facts and observations of the audit together in concern with the Environment Management System.

- **Evaluation of Findings**

The auditor evaluates the findings as per the standard procedure.

- **Reporting with Recommendations**

The auditor prepares a brief report of the audit along with recommendations in consultation with the EMS and sends it to the auditing agency.

- **Preparation of an Action Plan**

According to the recommendations given by an auditor the EMS should chalk out the action plan and accomplish it effectively.

- **Follow-up**

The auditor takes the follow-up of the programmes or activities periodically.

Certification

After successful completion of audit, an organization will be honoured with the certificate and the certificate is valid for three years.



Continuous Process Assessment

As mentioned earlier the green audit is continuous process. The Environment Management System of an organization should adhere to this continuous process of green auditing as per the environment policy and recommendations and go for the auditing process again after three years.

Initiatives by academic institutes for Green Campus

As green auditing aims at improving the environmental status, following measures can be taken by academic institutes to contribute toward sustainable environment.

Generating carbon foot print data

Carbon foot print is the total amount of Green House Gases (GHGs) emitted in terms of carbon dioxide by a person, institute, company, state or country. For calculation of carbon foot print the basic data regarding direct and indirect sources of emission of Green House Gases is needed. The GHG emissions are generally calculated through the application of documented emission factors. The documented emission factors are ratios relating GHG emission to proxy measures of activities (GHGP Ref) like use of electricity, use of diesel generators for electricity generation or any other purpose, LPG consumption, food wasted and vehicular emission. The software like ChevronTexaco are available to calculate the GHG.

Reduction of GHGs can be achieved by plantation. It is a widely accepted solution for reduction of carbon foot print on campus. The plants selected must be suitable to the soil and climatic conditions. Indigenous plants which help in building soil fertility and coppicing ability are suitable for the academic campus. Tree census should be conducted periodically. Measures for biodiversity conservation also highlight the efforts towards environment. Even though plantation is regular activity in the academic institutions, 50% institutes take sincere efforts towards it while 50% of the institutes do not have sincere concern about it. Following 'No vehicle' day, use of bicycles, public transport are many options. However, readiness towards its acceptance is needed.

Energy management

Consumption of energy helps in understanding the success towards green environment. Lesser the consumption of energy more contribution the environment is. Electricity can be used efficiently by replacing CFL bulbs and tube lights with LED lamps and fluroscnt tubes wherever possible and use of LED screens in place of CRT. Star rated Air conditioners should be placed in place of old air conditioners. Efficiency of air conditioners should be increased by minimizing the leakage using through open doors and cupboards of the room. Infrastructural changes that allows maximum natural light but minimizes heat in-grace help in reducing the use of electricity. Simple practices like cleaning



skylights and lamps will increase the luminosity. There should not be any idle energy consumption. Screen savers on computers increase energy consumption than in sleep mode. Use of 15” monitor @1024*768 resolution consume 6 watt less energy than 17”-19” monitor with higher resolution (Gowri and Harikrishna 2014). Considering there are 500 computers in the institute, it is possible to reduce 3000 watt per day. Use of laptops over the desktops also help reducing energy consumption. Energy consumed by laptop is less than that of desktop (NRDC). Use of renewable source of energy is widely accepted option now a days. The survey showed that 60% of academic institutions in India opt for solar panels although not rely completely on to it. 20% of the institutions do not harness solar energy while 20% are not take need of solar energy seriously.

Solid Waste Management

Managing our own waste is the responsibility of every individual. The solid waste produced in academic institutes mainly consists of papers and garden waste. Other than that glassware and old instruments form the bulk. Paper waste can be reduced by maximizing e-communication and e-learning. Use of one side papers is one of the best solution for reducing paper waste. The papers after use can be turned into handmade papers. Some papers which do not have confidential data can be given into the scrap for recycling. Other recyclable materials like cardboards, broken glassware, and metal should be given to the vendors. Use of paper cups can be minimized by replacing them with ceramic cups. Single used plastic bottles can be replaced with refillable vessels. Plastic waste can be collected separately and given to the agencies which are specialized in recycling plastic waste. Tetrapacks also can be collected separately and given for the agencies reuse and recycle them. Disposal of sanitary waste should not be neglected. At educational institute good quality incinerators is the best option which reduces the sterile ash. Garden waste can be for composting. Many efficient and effortless processes are existing for the same. Many academic institutions follow most of these practices. Composting is one of the easiest ways to manage biodegradable waste. During current study it was found that only 50% colleges do composting, 20% donot do and 30% are not serious about it.

Silvennoinenet al. (2015) divide food waste between originally edible and originally inedible, the latter referring to, for example, vegetable peelings, bones and coffee grounds. The food waste of both the categories can be managed efficiently by having biogas plants and anaerobic digesters. The sludge can be further processed into compost. Study by California energy commission estimated that codigestion food processing waste and waste water at waste water treatment plant could increase biogas potential (Kulkarni 2009). However, the pre-processing of food waste before co-digestion is needed (Kuo and Dow 2015). The biogas, thus generated can be used to replace LPG in biogas and chemistry



laboratories. Any academic institute hardly indulge into biogas and sewage treatment plant in their institution.

Water management

Water is a very valuable resource and everybody is gaining the awareness about the value of water. Many known technologies can work efficiently. Rain water harvesting, sewage treatment and its use for horticulture and garden, no leakage from the tap, use of push button taps, use of lowflow faucets, automatic faucets, and/or faucet aerators, use of condensed water of AC for gardening, use of sprinklers for watering lawn, use of RO water, Recycling of RO waste water are few of them. Rain water harvesting is choice for water management in 70% of academic institutes of India according to the present study. The study also says that only 20% have sewage treatment plant.

Hazardous waste Management

Green Chemistry approach helps in reducing the excess use of chemicals and also provides approach towards reducing hazardous waste products. Broken glassware, plastic needles, syringes, razor blades, slides, scalpels, pipettes, broken plastic or glassware, micropipettes and pipette tips ware creates a potential hazard. Triple rinse with copious amounts of water help in reducing the pathogens and neutralizing harmful chemicals on to it. Collect the first rinse as chemical/harmful waste. Rinse two and three can go down the sanitary sewer. The empty/triple rinsed containers can then be placed in a glass only box, recycling container or directly into the dumpster. Use of sterilized agar waste for composting is one of the ways of waste management. Purchase of minimal chemicals as per the requirement avoids wastage of chemicals.

E-waste management

Management of E-waste is more challenging problem rising along with development in technologies. Kitila (2015) found in his study in educational institutions of Ethiopia that desk top computers generate majority of E-waste since most of the staff and students rely on them for their work and lifespan of computers is very short. The main reason for voluminous E-waste is lack of awareness about the potential hazard to living being and to environment, absence of legislations, shortage of recyclers and refurbishing shops etc. There is very scarce data regarding e-waste generation and its management in Indian Academic Institutions. The survey conducted during the study showed that 50% institutions handover the e-waste to the agency for further disposal whereas 50% of them have not responded.



Conclusion

Green audit, also referred as environmental audit should be implemented by higher education institutes. One should understand the process of environmental auditing. It is a continuous process. Once learnt about the short fall about the efforts towards environmental conservation, one can plan about some of the initiatives mentioned above. Though academic institutes take part in restoring the environment, still there is scope for the further action.

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