

ENVIRONMENTAL AUDIT TOWARDS ENERGY CONSERVATION: A CASE STUDY OF HRDC, HIMACHAL PRADESH UNIVERSITY, SHIMLA

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Abstract

Environmental audits are tools which can quantify an organizational environmental performance and position. There are three main types of audits which are environmental compliance audits, environmental management audits to verify whether an organization meets its stated objectives, and functional environmental audits such as for water and electricity.

When environmental audits are designed to identify environmental problems, there may be widely differing reasons for undertaking them: compliance with legislation, pressure from suppliers and customers, requirements from insurers or for capital projects, or to demonstrate environmental activities to the public. The benefits of environmental auditing are large if are conducting well and following the reconditions.

The researchers selected Environmental audit at HRDC, HPU which is expected to provide the teachers an understanding about the environment in which they are working. They sensitize teachers about the students' expectations and perceptions. These teachers are the future managers of the education enterprise. Therefore, they must develop an insight into the dynamics of working in the educational system and can teach the students.

Keywords: Audit, Energy, Environment Management, legislations.

INTRODUCTION

Environmental audits are tools which can quantify an organizational environmental performance and position. There are three main types of audits which are environmental compliance audits, environmental management audits to verify whether an organization meets its stated objectives, and, functional environmental audits such as for water and electricity.

Environmental auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organizations of all kinds now recognize the importance of environmental matters and accept that their environmental performance will be scrutinized by a wide range of interested parties. Environmental auditing is used to Investigate, Understand and Identify.

These are used to help improve existing human activities, with the aim of reducing the adverse effects of these activities on the environment. An environmental auditor will study an organization's environmental effects in a systematic and documented manner and will produce an environmental audit report. There are many reasons for undertaking an environmental audit, which include issues such as environmental legislation and pressure from

customers.

Benefits vary depending on the objectives and scope of the audit. Environmental auditing benefits include Organizations understand how to meet their legal requirements, Meeting specific statutory reporting requirements, Organizations can demonstrate they are environmentally responsible, Organizations can demonstrate their environmental policy is implemented, Understanding environmental interactions of products, services & activity.

The benefits of auditing

While environmental audits are designed to identify environmental problems, there may be widely differing reasons for undertaking them: compliance with legislation, pressure from suppliers and customers, requirements from insurers or for capital projects, or to demonstrate environmental activities to the public. The benefits of environmental auditing include:

Ensuring compliance, not only with laws, regulations and standards, but also with company policies and the requirements of an Environmental Management System (EMS) standard; Enabling environmental problems and risks to be anticipated and responses planned; to demonstrate that an organization is aware of its impact upon the environment through providing feedback; increased awareness amongst stakeholders; and more efficient resource use and financial savings.

Trends/future developments

Audit programmes are becoming a standard environmental management tool and pressures for the disclosure of audit results are increasing. Public statements of environmental information with external validation are required by those participating in the European or local authority Eco-Management and Audit Scheme. The utility of environmental audits vary from organization to organization. It is likely that audits will be used increasingly to: provide baseline information to enable organizations to evaluate and manage environmental change, threat and risk; form the basis for initiating and monitoring the performance of Environmental Management Systems; contribute to environmental management approaches which become integrated with environmental impact assessment and the management of predicted impacts, mitigation and monitoring measures; support the implementation and management of integrated pollution control procedures and assist in the definition of 'best practicable environmental options' (BPEO); tackle external off-site impacts which consider the broader environmental footprint of an organization's activities; and pass environmentally responsible approaches down the supply chain.

Environmental audits have traditionally dealt with the environmental effects of industrial processes and, to a lesser extent, with resource consumption. Guided by the legislation and compliance procedures, the environment has usually been considered in terms of air land and water. Considerable conservation benefits could be achieved by broadening the focus of auditing to include natural heritage features and objectives. This would include natural heritage legislation and by the application of audit techniques to habitats and land use, such as farm units (Edwards et al.. 1992, LEAF, 1994), forest management units, or sporting estates. Generic approaches could contribute to the development of conservation management plans.

STUDY AREA

Human Resource Development Centre, Himachal Pradesh University, Shimla established in June, 1989, the Human Resource Development Centre of Himachal Pradesh University conducted its First Orientation Programme

in Sept. 1989. Prof. Yoginder Verma was the first Director of Human Resource Development Centre who implemented the number of creative activities during the Orientation Programmes and Refresher Courses which were followed by the next Directors. Then Prof. Kulwant Singh Pathania, Prof. Bal Krishan and Prof. Bhupinder Singh Marh joined HRDC before Prof. (Mrs.) Kiran Rekha assumed the charge of the Director with dedication to carry on the legacy in 2014. It has pursued the objective of improving the professional competence of teachers in tertiary education with a difference. By the end of September 2014, it had organized 400 programmes 113 Orientation Programmes and 283 Refresher Courses and one Summer School in which about 13000 teachers participated.

Educational Gadgets

The college has developed its two Conference Rooms, which are well equipped with Audio- Visual facilities, multi-media projection systems, tape-recorder and conference systems. The teacher-learners are exposed to the educational facilities not in theory but also in practice through different exercises. An intensive use of multi-media projector (compatible with computer), VCR and VCD, LCD, Web Camera, Digital Camera, Eduset), overhead projector, computer, slide projector, VCR, tape-recorder etc. adds a new dimension to the whole activity.

It Lab and Edusat

The HRDC has established a modern air conditioned state-of- the-art IT lab with capacity of 32 computers. It has VSAT and infibnet available on these intra networked computers. The HRDC is also having the facility of EDUSAT which is utilised for inter institutional tele-conference.

Performance of HRDC

It is noted with great satisfaction that Human Resource Development Centre organized 5238 programmes by January 1999 compared to 41. by April 1988. upto January 1999, more than one lakh forty seven thousand teachers have participated in these prorammes. The analysis of the feedback shows that these programmes have been very useful. The HRDC are expected to provide the teachers an understanding about the environment in which they are working. They sensitize teachers about the student's expectations and perceptions. These teachers are the future managers of the education enterprise. Therefore, they must develop an insight into the dynamics of working in the educational system. They inculcate appropriate teaching and research skills among the teachers.

OBJECTIVES

1. To introduce the practices those have impact on environmental degradation.
2. To catapult the green practices in university campus for conservation of natural resources.
3. Monitor the temporal changes in green practice
4. To prepare a green report for enhancing value added academic, research and administrative activities.
5. To acquire and analyze data and finding the energy consumption pattern of these facilities.
6. To calculate the wastage pattern based on the results of the first objective.
7. The final objective is to find and implement solutions that are acceptable and feasible.

METHODOLOGY

The objectives for green audit have been slated in the preceding chapter and that the present exercise is a maiden

attempt with no baseline data and it is envisaged to cover the following:

- Assessing of the University of Critical natural resources, their developmental and management in the most comprehensive method.
- Formulating strategies and plans that would be the principles for recommendations and advising various bodies that include universities, institutions and colleges, Internal-Quality Assessment Cell's for green policy.
- Spreading the gospel of Green-Growth with Resource Enhancement for Environment and Nature (Green).
- Assessing and sensitizing the challenges of integrating environmental issues with university development.

For the purpose, the present investigation is based on various inventories through a questionnaires formulated for conducting the green audit. The questionnaire incorporates various facets/guidelines prepared by MoEF, New Delhi, Central and State pollution control boards and various research institutions. At some places of questionnaire modifications was necessitated due to the local scenario. Annexure 1, 2, and 3 enclosed are for Solid Waste, Water and Electricity audit, respectively. All infrastructures and amenities were scrupulously inspected by the teams and the conditions therein checked with the help of the questionnaire. The net picture is not very inspiring overall, even though in some areas, the results produced appear very encouraging. The usefulness of the present attempt consists not only in assessment of the past but a rigorous estimation of where we are going on the basis of current trends. It is needless to state, any projection far into the future, as in this case, is fraught with uncertainty. HRDC Shimla being at its infancy, projections into the distance future is beheld with uncertainty. However, "Sustainable Development" has been the catch words for the institution.

The methodology adopted for this audit was

- ✓ formation of audit groups for specific areas
- ✓ Visual inspection and data collection
- ✓ Observations on the general condition of the facility and equipment and quantification
- ✓ Identification /verification of energy consumption and other parameters by measurements detailed calculations, analyses and assumptions
- ✓ Validation
- ✓ Potential energy saving opportunities
- ✓ Implementation

RESULT AND DISCUSSION

Electricity Audit

The fundamental goal of energy management is to produce goods and provide services with the least cost and least environmental effect."The judicious and effective use of energy to maximize profits (minimize costs) and enhance competitive positions"."The strategy of adjusting and optimizing energy, using systems and procedures so as to reduce energy requirements per unit of output while holding constant or reducing total costs of producing the output from these systems"

(Cape Hart, Turner and Kennedy, Guide to Energy Management Fairmont press inc. 1997)

Energy Audit is the key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in a facility. It

quantifies energy usage according to its discrete functions.

As per the Energy Conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption".

The electricity audit is envisaged to make HRDC campus energy efficient. Campus community uses a huge amount of energy and it is very obvious that we waste quite a sizable chunk of it. Making HRDC campus energy efficient will not only help it reduce its expenses but helps us in fulfilling our moral responsibility of saving the precious resource.

The HRDC has made a humble beginning in developing a framework for conducting an electricity audit. Various steps in the audit are data collection that includes questionnaire method, data analysis and development of action plan for energy consumption. During the data collection and analysis care was taken to account for

1. The type of electrical appliances or device used in each section.
2. The level of awareness regarding energy conservation among the beneficiaries of university which include students, teachers, non-teaching employee and administration.
3. Abuse of electricity.

Sr. No.	Name of Rooms	Tube Light (1@40W)	Fans (1@100W)	PC (1@250W)	AC/Heater (1@2000W)	Plug Point (1@40W)
1.	Class Room 1	13	2	1	0	1
2.	Class Room 2	14	0	1	2	1
3.	Staff Room 1	7	0	3	2	2
4.	Staff Room 2	2	0	1	1	1
5.	Computer Lab	10	0	32	1	1
6.	Library	4	0	1	1	0
7.	Office	3	0	4	3	1
Total		53	2	43	10	7
Watt		2120 W	200 W	10750 W	20000 W	280 W

Energy consumption in various rooms of the HRDC campus

RECOMMENDATION

Most of the electrical energy is consumed by Tube lights only then computer Lab for computers but most of the electrical energy is used during winter time heaters.

As most of the electrical energy is used by tube lights only, so we recommend use of CFLs or LED bulbs instead of tube lights which will save most of the energy. Current consumption of 53 tube lights is 2120 W, if same number of means 53 CFLs used of 20 W which is equal to 40 W of one tube light 50% Energy will be saved, Again recent technology of LED bulbs of 7 W for each LED bulbs which is equal to one 40 W of tube light more than 80% of energy will be saved.

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