Green Audit/ Energy Audit/ Environmental Audit



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Introduction

Government of India through its National Environment Policy in 2006, has made mandatory for every organization to have green audit / environmental audit in their organization. The process of environmental audit was formalized 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. Accordingly, realizing the need of responsibility towards environment, NAAC (National Assessment and Accreditation Council), an autonomous body under UGC has also added the concept of environmental audit in accreditation methodologies of State and Central Universities as well as colleges. Accordingly, Uttarakhand Open University has also initiated a Green/Environmental Audit/Energy Audit of its Campus at Haldwani.

Vision of University

To make higher education the potent medium of growth by creating knowledge and to provide easily accessible and convenient opportunities for value-based quality higher education to the people of Uttarakhand especially to youth, educationally deprived, and employed persons so that they are motivated for life-long-learning thereby ensuring their proficiency in different skills, securing self-employment, and employment with the motto of appropriate service to the state, nation and entire humanity.

About the University

Uttarakhand Open University (UOU) was established in the year 2005 by an act of state legislature. It is mandated to promote the dissemination of learning and knowledge though the medium of Open and Distance Learning (ODL). In this process extensive use of Information and Communication Technology (ICT) shall be made to provide opportunities of higher education to a large segment of the population of the state. The University is mandated to impart education through any means of communication such as broadcasting, telecasting, courses under ODL, seminars, contact programmes or combination of any two or more of such means. The University is further mandated to impart education through a network of Regional Centers to be established and maintained by the university for the purpose of coordination and supervision of the functioning of Study Centers. These Study Centers are also to be to be established, maintained or recognized by the University for the purpose of advising, counseling or for rendering any other assistance required by the students. Following the philosophy of ODL the University is also maintaining the policy of Openness and flexibility in terms of relaxed entry, duration, for completing a programme and place of study. Continuous efforts are made to widen the access by offering high quality innovative and need based programmes at different levels especially for the disadvantaged and marginalized segments of society at affordable cost by using a variety of media and technology.

The University develops its academic programmes through the Schools of Studies. The Schools of Studies are academic bodies responsible for all academic and related administrative activities of the university. Each School has different disciplines which function as departments which are the basic academic units responsible for the conceptualization, design, development and maintenance of the academic and professional programmes. The existing Schools of Studies at present are as follows:



Objectives of Green/ Energy/ Environment Audit

The main objectives of Environmental Audit in Academic Institution are:

- •To understand the awareness of employees and students towards environmental conservation
- •To recognize the initiative taken by organization towards environmental conservation
- •To understand and recognize the effects of an organization on the environment and vice versa
- •To ensure that the natural resources are utilized properly as per national policy of environment
- •To study waste minimization and safe disposal of waste particularly hazardous wastes
- •To initiatives for water and energy conservation

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- •To contribution and participation of various stakeholders in the environmental protection
- •To diagnose and resolve the environmental problems
 - •To facilitate the stakeholders with different aspects of disaster management

Scope and goals of Environmental Auditing

Government of India through its National Environment Policy in 2006, has made mandatory for every organization to conduct green audit / environmental audit in order to ensure a clean and healthy environment within and outside the organization. Further, it also helps in effective learning and provides a conducive learning environment. Efforts are taking place around the world in order to address various environmental issues. Green auditing or environmental auditing is one among them for educational institutions. Green auditing helps organization to understand various environmental issues of the organization and identify existing lacuna or gap towards meeting the objective of National Environmental Policy and thus, to plan accordingly.

Process or Methodology of Environmental Audit

An environmental audit has three phases - pre-audit stage, audit stage and post-audit stage, and accordingly the environmental audit was conducted.

Pre-audit Stage

Audit Stage

Post-Audit Stage

1) Pre-audit Stage

Pre-audit stage involved the identification of target areas for environmental auditing. Accordingly following target areas were identified:



2) Audit Stage

a) Collection of data through observation and interaction: This stage of the Audit involved the activities relating to collection of data through observation, interactions and discussion with the concerned stakeholders i.e., faculty, administration and staff from different of departments and sections of the university. A mix of open ended and closed ended questionnaires were also developed. Meetings with specific stakeholders of different target areas identified in the pre-audit stage ware conducted for getting the data. Detailed discussion on some specific topic were also held.

b) Review of previous records and policies: This was carried out in order to understand the various initiatives taken by the University towards environmental protection and amelioration. For the purpose, office registers, visitor's book, purchase registers, office communications, policy level documents of AC/ EC were also examined. Further, the published material such as prospectus, University annual reports, bulletins, and other magazines were also studied by the audit team for getting information / data on the target aspects.

c) Inspection of departments/sections / various sites: The audit team also visited the various departments, sections, offices and its premises in order to have an idea of vcarious activities carried. Campus greenery and gaps were identified. Team also had a visit to play ground, canteen, library, office rooms and parking area.

d) The stakeholders: The stakeholders included teaching staff from different schools, people from administration, water supply and maintenance, electricity department and ICT. The committee set up for the purpose discussed the issues related with key target areas. Questionnaires were prepared for getting information and accordingly meeting with concerned stakeholder was conducted. Data on water and energy use was collected from maintenance department. The different questionnaires formulated for the purpose are as follows:

3) **Post-Audit Stage**



A) Audit Report

i) Sources of air pollution: It was observed and revealed from data that the main sources of pollution in the University Campus are as use of diesel / petrol vehicles, air-conditioners, power generator, kitchen waste and other biodegradable waste from canteen and use of electronic appliances such as solid waste from electronic goods, cartridges, other solid waste etc.



There are five (05) office vehicles (Cars), 42 personal cars, 45 personal two-wheelers and 05 cycles are being used by the employees of the organization. Thirty (31) people are using pooled vehicle/ share auto taxi or shared two wheeler for commuting to University. There are also people who are using environment friendly vehicle i.e., cycle, but the percentage is very low nearly 4.6 per cent. Further, people commuting through walking are also only 8 %.

ii) Water Resources and Management: University has its own tube well for meeting its water requirements for various purposes such as drinking, use in washrooms, canteen and gardening. Since the University does not have staff quarters at present in the University premises, therefore, no household domestic water demand is there, therefore, majority of water consumed in the University premises is for sanitary and gardening purposes.



Water Harvesting Tank

Since University operates its Science programmes through its study centres, therefore, at present Science Departments does not have in-house labs and therefore, there is no requirement of water for laboratory purposes. There are 03 water coolers maintained by the organization for meeting drinking water demand of the employee. The audit team did not find any leakage in the taps of washrooms and in other areas. The water from tube-well is lifted to overhead tanks through an electric motor. There are ten (10) tanks with Total 06 tanks of 1000 liter capacity are placed in the roof tops of the University which are filled up daily.

iii) Energy consumption: Electricity is mainly needed for lighting the rooms, cooling the rooms in summer and heating the rooms in winter and running computer systems. University has a server room which needs electricity all the day and night. Apart from this University also has a community radio station which also demands electricity. Apart from this, University has its own tube well connected with electric motor of 2 hp. Water from the tube well is lifted to overhead tanks placed in the roof top daily and for the purpose machine runs for 2 hours daily. University has a sanctioned load of 125 KW from Uttarakhand Power Corporation (UPCL). In addition to this, there are two diesel generators installed for meeting energy requirement during power cut off. On an average one to two hours a days, electricity is generated from these generators.

iv) Waste disposal and management



Organic Composting

Both biodegradable as well as non-biodegradable wastes are generated from various departments/ sections of the University. The principal wastes includes paper, grasses, electronic wastes, canteen waste and other solid wastes. Since, University operates on ODL mode, therefore, number of students visiting the campus are comparatively less when compared with regular universities. Therefore, the waste generated through classroom activity and student's activities negligible. Whereas the plastic waste is completely banned in the university campus. However, the biodegradable waste produced in various departments, sports ground or other areas is put into compost pits for making compost which is made use of in fertilizing garden plants and seedling planted during planting season.

v) Environmental Awareness

People in the campus are aware bout the various environmental issues and the various green measures to be adopted in office as well as their home. A course on Environmental Studies is compulsory for all Under Graduate students. Further, university conducts plantation drives in the open areas in the Campus during Environment Day, 15 August and during other important events in the University. Further, University has also adopted nearby villages and environmental awareness activities, health camps and other community programmes are being conducted through their participation.



Plantation by students

vi) Mitigation and Management practices

University is at present following practices for environmental protection:

a) Maintenance of Lush Green Campus: University has a ten hectares of land which was transferred to it from Forest Department for the purpose of creating infrastructure required for the development of various Offices/ Departments of the University. Although felling of trees is for development of various infrastructure cannot be avoided, yet only those trees are felled which fall in the development area and others are not disturbed.

b) Plantation drives: Plantation drives are regular activities in the Campus, and usually in all important occasions, plantation activity is taken up. University has maintained a garden in which different ornamental plants have been raised.



Plantation Drive in University Campus

c) Organic composting: The activity of making organic compost has been initiated in the campus where all the biodegradable waste material are filled up in the compost pit. In the course of time, organic compost is prepared. This organic compost is utilized for manuring in flowerbeds and plantations.

d) Energy conservation efforts

i. University is using star rated Electrical & Electronics equipment which save energy. LED Bulbs/ Tube-light, 4-5 star Rated Air Conditioners.

ii. University has always been effortful in making use of renewable energy resources. For the purpose, University has applied for 10 KV Solar Power plant. The application has been forwarded and soon University will have in captive power generation through Solar Power Plant.

e) Water Conservation Measures through water harvesting tank: In order to reduce dependency of water from tube-well and also to recharge underground water resources, University had created a water harvesting tank in the back side of the Campus.

B) Recommendations

After a detailed study on various aspects relating to the target areas identified in pre audit stage, the audit team recommends following:

- Although some people doing carpooling and two wheeler pooling, yet the percentage is low compared to total vehicles used in the University for commuting. Therefore, employees may be motivated for carpooling. Alternatively a common bus service may be initiated by the University, which may contribute effectively to reduce total carbon foot print of the Organization.
- **2.** The solar power generation activity should be geared up so that dependency on electricity and generator based energy is reduced.
- **3.** Water harvesting tank should have LDPE lining so that water may be stored for longer duration. Further, it is suggested that there should be provision of raised water harvesting tank in which rain water may be stored and utilized for flush water.
- 4. The following programmes on environmental education should be initiated:
 - a. Training programmes in solid waste management/ liquid waste management
 - b. Training programme on water management should be carried out
- **5.** The water cooler and filtration system should be regularly checked up so that health of employees remain good.
- 6. Since the most of the campus has important Teak or sagaun (Tectona grandis) trees, therefore, there are chances of illegal felling from nearby areas. Therefore, the roads inside the University Campus should be clearly demarcated and all the corners of the campus are easily approachable so that regular patrolling by the security staff be carried out.
- 7. Water from Tube-well is presently uplifted through motor using electric power from UPCL whereas the same can be converted to solar based motor system.

<u>Reference</u>

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