

Environmental Audit



कुलसचिव / REGISTRAR
कर्नाटक केन्द्रीय विश्वविद्यालय
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INTRODUCTION

Environment Audit an Effective Efforts towards Environment Sustainability & Energy Conservation

Modernization and Industrialization are the two important outputs of the twentieth century that have made human life more luxurious and comfortable. Simultaneously, they are responsible for various uses of natural resources, exploitation of forest and wildlife, producing passive solid waste, polluting the scarce and sacred water resources, and finally making our mother Earth ugly and in-hospitable. Today, people are getting more familiar with global issues like global warming, greenhouse effect, ozone depletion, and climate change, etc. Now, it is considered as a final call by Mother Earth to walk on the path of sustainable development. The time has come to wake up, unite and combat together for a sustainable environment.

Considering the present environmental problems of pollution and excessive use of natural resources, Hon'ble Prime Minister Shri Narendra Modi ji has declared the Mission of Swachh Bharat Abhiyan. Also, University Grants Commission has mentioned the "Green Campus, Clean Campus" mission mandatory for all higher educational institutes. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. Govt. of India has issued National Education Policy 2020 and has issued white paper on its policy. Generation coming should be well conversant with the effects and impacts on Environment and Modernization/Development. Coming generations must know how to make a balance in both.

Environment Audit is the most efficient ecological tool to solve such environmental problems. It is a process of regular identification, quantification, documenting, reporting, and monitoring of environmentally important components in a specified area. Through this process, the regular environmental activities are monitored within and outside of the concerned sites which have direct and indirect impacts on the surroundings. An environmental audit can be one of the initiatives for such institutes to account for their energy, water resource use as well as wastewater, solid waste, hazardous waste generation. The environmental Audit process can play an important role in the promotion of environmental awareness and sensitization about resource use. It can create consciousness towards ecological balance, values, and ethics. Through the green audit, one can get direction about how to improve the condition of the environment without much affecting the impact on nature.

Environment Audit

Environment auditing is the process of identifying and determining whether an institution's practices are eco-friendly and sustainable. Traditionally, we are good and efficient users of natural resources. However, over the period excess use of resources like energy, water, chemicals are become habitual for everyone especially, in common areas. Now, it is necessary to check whether our processes are consuming more than the required resources? Whether we are handling waste carefully? In fact, as per modern thinking there is waste as such. The policy of Waste to Wealth has been the new concept introduced. Environment audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion, it is necessary to verify the processes and convert the min to green and clean ones.

The environmental audit provides an approach for it. It also increases overall consciousness and awareness among the people working in institutions towards an environment.

Goals of Environment audit

Central University of Karnataka has conducted an Environment audit with specific goals as:

- Assess the facility of different types of waste management.
- All waste shall be first finding the scope of its use under the Waste to Wealth policy.
- Increase environmental awareness throughout campus.
- Identification and documentation of green practices followed by university.
- Identify strengths and weaknesses in green practices.
- Conduct a survey to know the ground reality about green practices.
- Analyze and suggest solutions for problems identified from the survey.
- Identify and assess environmental risk.
- Short-term goal of environment audit program.
- The long-term goal of the environmental audit program is to collect base line data of environmental parameters and resolve environmental issues.
- To motivate staff and students for optimized sustainable use of available resources.

Objectives of Environment audit

- To examine the current practices which can impact the environment such as water, air, optimum resource utilization, waste management, etc.
- To prepare an Environmental Statement Report on green practices followed by different departments, support services, and administration building.
- To set goals (Short/ Long), vision, and mission for Green practices on the campus.
- To identify and analyze significant environmental issues.
- To establish and implement Environmental Management Plan (EMP) in various departments and review them periodically.
- To assess for better performance in green practices and its valuation.


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About Criteria 7 of NAAC

Universities are playing a key role in the development of human resources worldwide. Government of India through NEP 2020 has framed the policy under which there shall be 4 verticals out of which NAAC vertical will be governed for independently assessment of all HEIs. Higher education institutes on campus run various activities with the aim to percolate the knowledge along with practical dimension among the society. Likewise, different technological solutions related to the environment are also provided by the higher education institutes. Different types of evolutionary methods are used to assess the problem concerning the environment. It includes Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Carbon Footprint Mapping, environment audit, etc.

The National Assessment and Accreditation Council (NAAC) is a self-governing organization that rated the institutions according to the scores assigned at the time of accreditation of the institution. Environmental Audit has become a mandatory procedure for educational institutes under NEP 2020 and in Criterion VII of NAAC. The intention of the green audits is to upgrade the environmental condition inside and around the institution. It is performed by considering environmental parameters like optimum use of water and wastewater (approach of recycling and reusing of the same) and accounting, energy conservation, possibilities of new/renewable energy, waste management, air, noise monitoring, facilities for females and differentially abled persons etc. for making the institution eco-friendlier.

Students are the major strength of any academic institution. They are also the future of the nation. Hence educating the Practicing green action in any educational institution will inculcate the good habit of caring for natural resources in students. Many environmental activities like plantation and nurturing saplings and trees, Cleanliness drives, Bird watching camps, no vehicle day, Rainwater harvesting, etc. will make the students good citizens of the country, Through Green Audit, higher educational institutions can ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

Benefits of Environment Audit to an Educational Institute

There are many advantages of Environment audit to an Educational Institute.

- It would help to protect the environment in and around the campus.
- Recognize the cost-saving methods through waste minimization and energy conservation.
- To identify and analyze significant environmental issues.
- To establish and implement Environmental Management Plan (EMP) in various departments and review them periodically.
- To assess for better performance in green practices and its valuation.

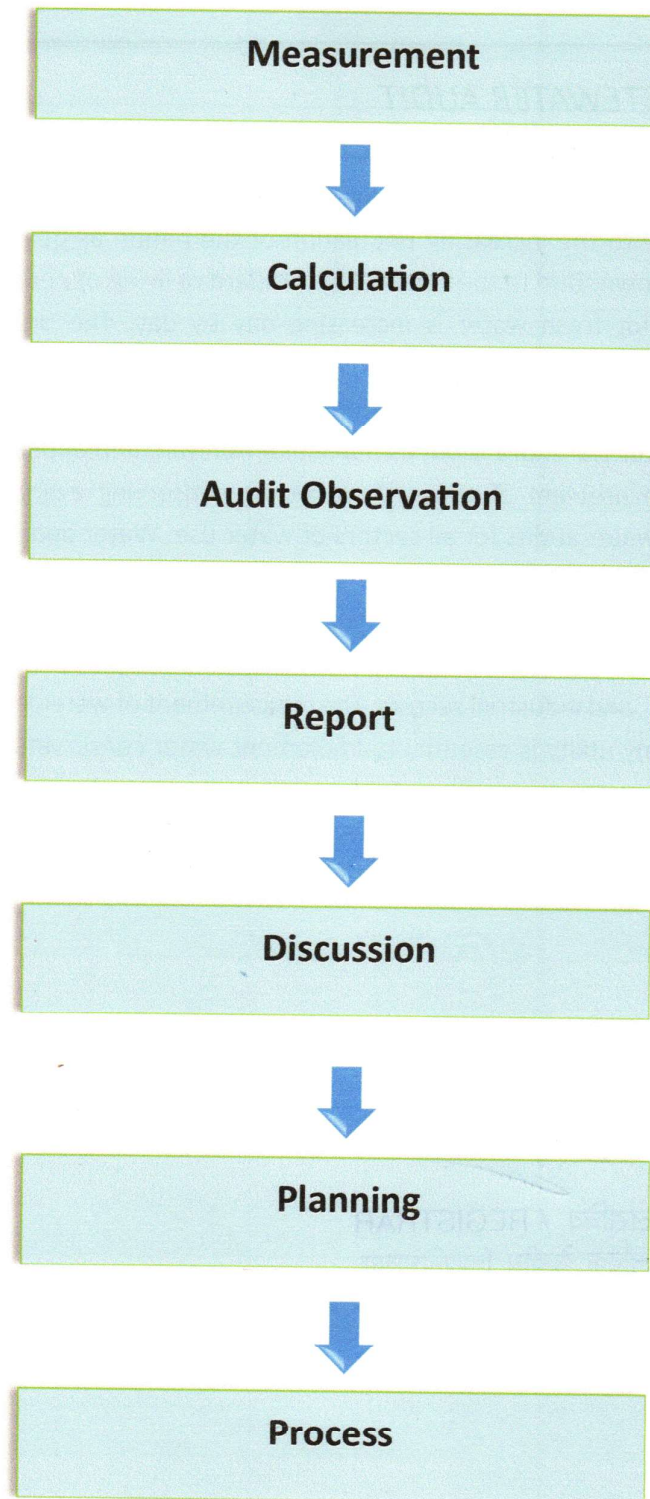
1.0 WATER & WASTEWATER AUDIT

1.1 Introduction

Water is a precious natural national resource available with affixed quantum. The availability of water is decreasing due to the increasing population of the nation as per capita availability of utilized water is going down. Due to the ever-rising standard of living of people, industrialization, urbanization, demand for fresh water is increasing day by day. The unabated discharge of industrial effluent in the available water bodies is reducing the quality of these ample sources of water continuously. Hence, the national mission on water conservation was declared by the Honorable Prime Minister Narendra Modi as 'Jal Shakti Abhiyan' and appealed to all citizens to collectively address the problem of water shortage, by conserving every drop of water and suggesting conducting water audits for all sectors of water use. Water audit can be defined as a qualitative and quantitative analysis of water consumption to identify means of reducing, reusing, and recycling water. Water Audit is nothing but an effective measure for minimizing losses, optimizing various uses, and thus enabling considerable conservation of water in their irrigation sector, domestic, power, and industrial sectors. The measurement of water losses due to different uses in the system or any utility is essential to implement water conservation measures in such an establishment.



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1.3 Importance of Water Audit

- Systematic process.
- May some surprising results.

- Easier to work on solutions when the problems are identified.
- Attracting mechanisms can be put into place.


It is observed that several factors like climate, culture, food habits, work and working conditions, level and type of development, and physiology determine the requirement of water. The community which has a population between 20,000 to 1,00,000 requires 100 to 150 liters per person (capita) per day. The communities with a population over 1,00,000 require 150 to 200 liters per person (capita) per day. As per the standards provided by WHO Regional Office for Southeast Asia Schools require 2 liters of water per student for drinking purposes; 10-15 liters per student for Water-flush toilets. Administration requires (Staff Accommodation not included) 50 liters per person per day.

1.4 Water Audit

The university is spread in a sprawling *lush green* campus of 654 acres dotted with buildings of Academic, Administrative and support services. Water usage can be defined as water used for all activities which are carried out on campus from different water sources. This includes usage in all residential buildings / hostels, academic buildings, on-campus, and on-grounds. Wastewater is referred to as the water which is transported off the campus. The wastewater includes sewerage; residence water used in cooking, showering, clothes washing as well as wastewater from chemical and biological laboratories which ultimately go down in the sink or drainage system.

1.5 Water Quality

Primary Water Quality Criteria for Bathing Waters, in a water body or its part, water is subjected to several types of uses. Depending on the types of uses and activities, water quality criteria have been specified to determine its suitability for a particular purpose. Among the various types of uses there is one use that demands the highest level of water quality or purity and that is termed as "Designated Best Use" in that stretch of water body. Based on this, water quality requirements have been specified for different uses in terms of primary water quality criteria. The primary water quality criteria for bathing water are specified along with the rationale in table 1. PRIMARY WATER QUALITY CRITERIA FOR BATHING WATER (Water used for organized outdoor bathing) CRITERIA 1. Fecal Coliform MPN/100 ml.; & Fecal Streptococci MPN/100 ml: 2. pH: 3. Dissolved Oxygen: 4. Biochemical Oxygen demand 3-day, 27°C: 500 (desirable) 2500 (Maximum Permissible) 100 (desirable) 500 (Maximum Permissible) Between 6.5 - 8.5 5 mg/1 or more 3 mg/1 or less RATIONALE to ensure low sewage contamination. The desirable and permissible limits are suggested to allow for fluctuation in environmental conditions such as seasonal change, changes in flow conditions etc. The range provides protection to the skin and delicate organs like eyes, nose, ears etc. which are directly exposed during outdoor bathing. The minimum dissolved oxygen concentration of 5 mg/1 ensures reasonable freedom from oxygen consuming organic pollution immediately upstream which is necessary for preventing production of anaerobic gases (obnoxious gases) from sediment. The Biochemical Oxygen Demand of 3 mg/1 or less of the water ensures reasonable freedom from oxygen demanding pollutants and prevents production of obnoxious gases.

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1.6 Drinking Water Quality

The drinking water quality in Kalaburagi, Karnataka, is mixed. Some studies have shown that the water is safe to drink, while others have found elevated levels of certain contaminants.

One study, conducted in 2022, found that the pH, turbidity, and dissolved solids levels in all of the water samples tested were within the permissible limits set by the Bureau of Indian Standards (BIS). However, the study also found that the calcium and magnesium levels in some of the samples were slightly elevated.

Another study, conducted in 2023, found that the levels of heavy metals such as lead, cadmium, and nickel in the Bhima River water, which is a major source of drinking water in Kalaburagi, were above the safe limits for human consumption. The study also found that the levels of these heavy metals were highest in samples collected near sewage runoff and along bridges.

The Karnataka State Pollution Control Board (KSPCB) regularly monitors the quality of drinking water in Kalaburagi. The KSPCB's website shows that the water quality in Kalaburagi has been generally good in recent years. However, there have been some instances where the water quality has dipped below acceptable levels.

Overall, the drinking water quality in Kalaburagi is variable. Some studies have shown that the water is safe to drink, while others have found elevated levels of certain contaminants. The ground water of Kalaburagi contains Designated Best Use Water Quality Criteria Designated-Best-Use Class of water Criteria Drinking Water Source without conventional treatment but after disinfection:

- A. Total Coliforms Organism MPN/100ml shall be 50 or less, pH between 6.5 and 8.5
Dissolved Oxygen 6 mg/l or more Biochemical Oxygen Demand 5 days 20C 2 mg/l or less
Outdoor bathing (Organized).
- B. Total Coliforms Organism MPN/100ml shall be 500 or less, pH between 6.5 and 8.5
Dissolved Oxygen 5 mg/l or more, Biochemical Oxygen Demand 5 days 20C 3 mg/l or less
Drinking water source after conventional treatment and disinfection.
- C. Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9
Dissolved Oxygen 4 mg/l or more Biochemical Oxygen Demand 5 days 20o C, 3 mg/l or less
Propagation of Wildlife and Fisheries.
- D. pH between 6.5 to 8.5 Dissolved Oxygen 4 mg/l or more Free Ammonia (as N) 1.2 mg/l
or less Irrigation, Industrial Cooling, Controlled Waste disposal.
- E. pH between 6.0 to 8.5 Electrical Conductivity at 25 OC micro mhos/cm Max.2250 Sodium
absorption Ratio Max. 26 Boron Max. 2 mg/l.

