

Environmental Auditing in Colleges: Practices and Principles

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Abstract: *The intention of organizing Environment audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly institute. Environment audit is a tool to identify the range of environmental impacts and assess the compliance of the operations on the development and regular activities within an organisation. It may also assess the compatibility of the operations within an organisation or a company with existing applicable laws and regulations and the expectations of their various stakeholders. It further assesses the possible implications and effect of pollution due to the operations within the organisation.*

Keywords: Environment audit, pre - audit stage, audit stage, post - audit stage

1. Introduction

Environmental audit is a process which can quantify an organisation's environmental performance and position. It is an independent third party assessment of the current status of an organization's compliance with local environmental laws and regulations. Environmental audit aims at examining the positive and negative effects of the activities of an enterprise on environment. In 1988 the International Chamber of Commerce (ICC) Position Paper on environmental auditing produced the following definition, which has now found wide acceptance: 'A management tool comprising asystematic, documented, periodic and objective evaluation of how well environmental organisation, management and equipment are performing with the aim of helping to safeguard the environment by: (i) Facilitating management control of environmental practices; and (ii) Assessing compliance with company policies, which would include meeting regulatory requirements (Todea et al., 2011).

The audit also seeks to identify possible means and methods to save investments, enhance work quality, improve health and safety of their employees, reduce liabilities and reduce the rate of environmental pollution. A continuous process of such audit might result in maintaining the quality of these aspects within the premises of any organisation. The college has adopted the 'Green Campus' system for environmental conservation and sustainability. There are main three pillars i. e. zero environmental foot print, positive impact on occupant health and performance and 100% graduates demonstrating environmental literacy. The goal is to reduce CO₂ emission, energy and water use, while creating atmosphere where students can learn and be healthy.

The purpose of the environmental audit is to provide an indication to the management of the improvements while environmental organization system & equipment are performing. To fulfil this purpose it is essential that audits should be seen as the responsibility of the company. The audit work can be voluntary and for the advantage of the company. The audit work can be done systematically and efficiently by the help of environmental auditing programme

(Aparajita Gogoi, 1995). It helps in the proper utilization of natural resources as a whole it improves environmental quality.

Environment Audit in India:

India is the first country in the world to make environmental audits compulsory EPA 2005. The government of India, by its gazette notification [No. GSR 329 (E)] of March 13, 1992, made it mandatory for all industries to provide annual environmental audit reports of their operations, beginning with 1992 - 93. This required industries to provide details of water, raw materials and energy resources used, and the products and wastes generated by them. These audit reports were to be submitted to the concerned State Pollution Control Boards or before September 30 every year. The critics of Environmental Audit feel that this notification was hurriedly implemented without the prior creation of necessary infrastructure/experts which would enable its appropriate implementation. This novel concept of environmental audit was distorted, surprisingly, by the government, when on April 22, 1993, by a revised notification [No. GSR.386 (E)] the term Audit Report was replaced by Environmental Statement. This change inevitably toned down the impact of the regulation.

Objectives of the Environment Audit:

The need to conduct an environmental audit varies for different organizations, as per the objectives of auditing. It is not available in the form of a readymade package, applicable to all situations. Thus, the procedure of environmental audit should be planned as per the objectives of auditing. It should be incorporated with other effective environmental tools like Environmental Impact Assessment (EIA) and Environmental Management System (EMS) for better results (Tripathy, D. P, 2011) To minimize human exposure to risks from environmental, health and safety problems (Priyanka Arora, 2017). The main objectives are:

- To ensure that the performance of the institution with respect to environmental activities they are involved in, is in compliance with existing laws and regulations.
- To measure the performance of each green related operations and actions in the campus.

- To generate a database of green activities for continuous monitoring to assess the success of each of them.
- To identify future potential liabilities.
- To align the institution's developmental and day to day activities with the stated vision, mission, strategies, etc.
- To identify possible ways to reduce expenditure and running costs on equipments, appliances, etc. or try enhance revenue income.
- To improve process and materials efficiency, and in response to stakeholder requests for increased disclosure.

Benefits of Environmental Audit

- Would help to prepare plan to project the environment.
- Recognize the cost saving methods through waste minimization and management.
- Point out the prevailing and fourth coming impacts on environment.
- Ensures conformity with the applicable laws.
- Empower the organizations to frame a better environmental performance.
- It portrays a good image of an institution which helps building better relationships with the group of interested parties.
- Promotes the alertness for environmental guidelines and duties.

The Environment auditing exercise is an essential component of the Annual Quality Assurance Report (AQAR) of the Internal Quality Assurance Cell (IQAR) of the concerned College and the information presented herein relates to the infrastructural and environmental components besides, the best practices being followed by the College under the vision and mission on eco - friendly academic services to society and the nation. It has documented not only the present status of campus flora, fauna, green energy and environmental quality parameters but it also envisioned the future course of action of the College administration in tune with eco - friendly and sustainable development of the College campus.

About the college

The Waikhom Mani Girls' College, Thoubal is within the geo - position between latitude 29°39'6.5" N and longitude 93°59'25" E located at Thoubal Okram, Thoubal District, Manipur, 22 km away from Imphal city, was established on 20th November 1980 with great enthusiasm by the local people, educationist and social workers for promotion of female higher education where the women literacy rate is very low in comparison to those of urban areas. The beautiful campus of the college is spread in 2 places. The main campus is at Thoubal Okram with fairly good infrastructure and there is satellite campus at Samu Manbi Ching, Thoubal Khunou. It situated at National Highway No.102 and Trans Asian Highway No.1. It is well connected to all parts of Manipur by National Highway and State High ways. The college has adequate space and class rooms. Administrative Block, Library building, Spacious class rooms with latest smart class equipment and laboratories, Basket ball court, Girls Hostel, College Canteen, Indoor stadium, Computer centre with good number of computers, well developed vocational works shed, well equipped research laboratory i. e. Biotech Hub contributed to all round

development of the students. In keeping with the UGC policy of vocationalization of education the college has opened 5 career oriented course and 6 skill development courses under B. Voc and Community College Scheme. Students of the college have also excellent in Extra - curriculum activities winning medals in sports and other cultural competition at the inter college level, state level and national level. Co - curricular activities include The National Service Scheme (NSS) and The National Cadet Cadet Corps (NCC)

2. Methodology

The purpose of the Environment audit of WMGC is to ensure that the practices followed in the campus are in accordance with the Green Policy of the country. The parameters required to assess the Environment audit were finalized based on the AQAR guidelines, covering the information related to energy, and environment. The methodology includes: collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

There are a number of different environmental auditing procedures advocated in the auditing literature. A model of the audit procedure which is universally accepted was first developed by Arthur D Little. This was later adopted by the International Chamber of Commerce (ICC) in 1989. Based on this approach, Humphrey and Hadley (2000) divided the environmental auditing process into three main areas of activity: pre - audit stage, audit stage and post - audit stage, accordingly the environmental audit was conducted.

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

- Land Use System
- Biodiversity Status
- Climatic Conditions
- Pollution
- Water Resources and Management
- Energy Consumption
- Waste disposal and management
- Environmental Awareness
- Mitigation and Management practices

Audit Stage

- a) Collection of data, observation and interaction: This stage of the Audit involved the activities relating to collection of data, observation, interactions and discussion with the concerned stakeholders i. e., faculty, administration and staff members from different departments and sections of the college. A mixture of open ended and closed ended questionnaires were developed and used for data collection. Meetings with specific stakeholders of different target groups identified in the pre - audit stage were conducted for getting the desired information. Detailed discussions 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 college towards sustainable environmental

conservation 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, college 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 energy consumed. Campus greenery and gaps were identified. Team also had a visit to play ground, canteen, library, office rooms and parking area.

Post - Audit Stage: The Post - Audit Stage includes the production of the final report, prepare action plan to overcome the flaws and to keep a watch on the action plan.

The methodology includes: collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

Audit Report

- (A) Land Use System: The Main campus of the college has 3.74 acres of land which includes Academic/ Administrative building, computer lab, toilets, classroom, common room, canteen, roads, indoors stadium and basket ball court and also the area under construction for some departments and parking area (Table 1). The Thoubal Khunou campus of the college has a total of 4.6 acres of land which was transferred from Department of Forests, Government of Manipur for the purpose of creating botanical garden and research activities which are required for the development of the college (Table 1).

Table 1: Land use pattern of the college

Main Campus (Thoubal Okram)		
Category	Area in Sq. Metres	Area in Acres
Built up		
New Girls Hostel	370.82	0.09
Manipuri Dept.	258.46	0.06
Green House	35.42	0.01
Gym - Adm Block, Old Girls Hostel, His Dept	1815.47	0.45
Edn Dept - Classroom, Sc. Block, Basketball Court etc.	4587.29	1.13
Entrance Road	519.28	0.13
Total Built up	7586.74	1.87
Vegetation with Trees	976.83	0.24
Waterbody	131.52	0.03
Open land/ Fallowland	6399.7	1.6
Total	15094.79	3.74
Thoubal Khunou Campus (Samu Manbi Ching)		
Category	Area in Sq. Metres	Area in Acres
Built up		
(Gardener/Store/Research & Wash - Room)	361.5	0.09
Waterbody	1387.72	0.35
Vegetation with Trees and Shurbs	2728.18	0.68
Agricultural Land	14115.52	3.48
Total	18592.92	4.6

- (B) Climatic Parameters: The Waikhom Mani Girl's College is located in subtropical zone. The climate of the area is monsoonic with warm moist summer and cool dry winter. The mean maximum temperature varied from 22.480C (December) to 30.190C (May) and the mean minimum temperature ranged from 4.970C (January) to 22.940C (August). The mean monthly rainfall ranged from 15.35mm (December) to 200.66mm (June). The average relative humidity of air varied between 72.91% (March) to 85.97% (July). The wet period is further divided into a moist mild summer season (March to May) and a rainy period (June to October). There is a consistent increase in rainfall from January onwards attaining the maximum value in June than it gradually decreased till December. There is a distinct moist summer (March to May), rainy (June to October) and winter (November to February) seasons.
- (C) Biodiversity Status: The area is immensely diverse with a variety of tree species performing a variety of functions. The campus of the college is located at sub tropical climatic conditions. Most of these tree species are planted in different periods of time through various

plantation programmes organised by the authority and have become an integral part of the college. The trees of the college have increased the quality of life, not only the college fraternity but also the people around of the college in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting wildlife, controlling climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer. Many species of birds are dependent on these trees mainly for food and shelter. Nectar of flowers and plants is a favourite of birds and many insects. Leaf – covered branches keep many animals, such as birds out of reach of predators. Different species display a seemingly endless variety of shapes, forms, texture and vibrant colours. Even individual trees vary their appearance throughout the course of the year as the seasons change. The strength, long lifespan and regal stature of trees give them a monument – like quality. They also remind us the glorious history of our institution in particular. We often make an emotional

connection with these trees and sometime become personally attached to the ones that we see every day. A thick belt of large shady trees in the periphery of the college have found to be bringing down noise and cut down dust and storms. Thus, the college has been

playing a significant role in maintaining the environment of the entire campus and in its surrounding areas. The following are the tree species (Table 2), herbs, shrubs and climber (Table3) and grasses (Table 4) with whom we are being attached:

Table 2: Tree species of Waikhom Mani Girls' College Campus

S. No	Botanical Name	Family	Common Name	Local Name	No of individuals
1.	<i>Acacia nilotica (L.) Del</i>	Leguminosae	Gum tree	Chingonglei	4
2.	<i>Artocarpus heterophyllus Lam</i>	Moraceae	Jack fruit	Theibong	4
3.	<i>Ardisia colorata Roxb.</i>	Myrsinaceae		Uthum	3
4.	<i>Azadirachta indica A. Juss.</i>	Meliaceae	Margosa/Nee m	Neem	7
5.	<i>Bauhinia acuminata L.</i>	Leguminosae	White orchid tree	Chingthrao angouba	4
6.	<i>Bauhinia variegata L.</i>	Leguminosae	Camel's foot tree	Chingthrao arangba	3
7.	<i>Citrus maxima (Burm.) Merr.</i>	Rutaceae	Shaddock	Nobab	2
8.	<i>Callistemon linearis DC.</i>	Myrtaceae	Bottle brush	Likli lei	22
9.	<i>Cupressus sempervirens L.</i>	Cupressaceae	Italian cypress		7
10.	<i>Delonix regia (Bojer) Raf.</i>	Leguminosae	Gol mohor	Gol mohor	
11.	<i>Dalbergia sissoo Roxb. ex DC.</i>	Leguminosae	Indian rose wood	Sisoo	2
12.	<i>Erythrina verigata Linn.</i>	Fabaceae	Coral tree	Kurao angouba	1
13.	<i>Elaeocarpus floribundus Blume</i>	Elaeocarpaceae	Olive nut	Chorphon	4
14.	<i>Eucalyptus globulus s Labill.</i>	Myrtaceae	Blue gum	Nasik	5
15.	<i>Ficus benghalensis L.</i>	Moraceae	Banyan tree	Khongnang bot	2
16.	<i>Ficus racemosa L. Syn. F. glomerata Roxb</i>	Moraceae	Fig	Heibong	2
17.	<i>Ficus benamina</i>	Moraceae	Weeping Fig	Khongnang tarung	11
18.	<i>Gmelina arborea Roxb.</i>	Lamiaceae	Wang	White teak	5
19.	<i>Mangifera indica L.</i>	Anacardiaceae	Mango	Heinou	35
20.	<i>Magnolia champaca (L.) Baill. ex Pierre Syn. Michelia champaca L.</i>	Magnoliaceae	Champak	Leihao	3
21.	<i>Psidium guajava L.</i>	Myrtaceae	Guava	Pungdon	3
22.	<i>Phyllanthus emblica L. Syn. Emblica officinalis Gaertn.</i>	Phyllanthaceae	Indian gooseberry	Heikru	3
23.	<i>Polyalthia longifolia (Sonner.) Thw</i>	Annonaceae	Mast tree	Ashok pambi	17
24.	<i>Phoenix humilis Royle ex Becc. & Hook. f.</i>	Arecaceae	Date palm	Thangtup	4
25.	<i>Punica granatum L</i>	Punicaceae	Pomegranate	Kaphoi	2
26.	<i>Syzygium cumini (L.) Skeels</i>	Myrtaceae	Black plum	Jam	5
27.	<i>Toona ciliata M. Roem. Syn. Cedrela toona Roxb. ex Rottler</i>	Meliaceae	Red cedar	Tairen	20

Table 3: Herbs, Shrubs and Climbers of Waikhom Mani Girls' College Campus

Sl. No	Botanical Name	Family	Common Name	Local Name
1.	<i>Agave cantala (Haw.) Roxb. Ex Salm - Dx Salm - Dyck</i>	Asparagaceae	Century plant	Kewa
2.	<i>Aloe vera (L.) Burm.</i>	Xanthorrhoeaceae	Ghrirkumari	Indian aloe
3.	<i>Artabotrys hexapetalus (L. f.) Bhandari</i>	Annonaceae	Climbing ylangylang	Chini champa
4.	<i>Asclepias curassavica L.</i>	Apocynaceae	Milkweed	Krishna chura
5.	<i>Bougainvillea spectabilis Willd.</i>	Nyctaginaceae	Glory of garden	Cherei
6.	<i>Calotropis gigantea (L.) Dryander</i>	Asclepiadaceae	Swallow wort	Aangot pambi
7.	<i>Catharanthus roseus (L.) G. Don</i>	Apocynaceae	Madagascar periwinkle	Saheb lei
8.	<i>Chrysanthemum atkinsoni C. B. Clarke</i>	Compositae	Chrysanthemum	Chandramukhi
9.	<i>Clerodendrum thompsoniae Balf</i>	Lamiaceae	Bleeding heart	Kundo manbi
10.	<i>Cycas pectinata D. Don</i>	Cycadaceae		Yendang
11.	<i>Gardenia angusta (L.) Merr.</i>	Rubiaceae	Cape jasmine	Kaboklei
12.	<i>Hibiscus rosa - sinensis L</i>	Malvaceae	China rose	Juba kushum
13.	<i>Jasminum sambac (L.) Ait.</i>	Oleaceae	Arabian jasmine	Mallika
14.	<i>Nerium oleander L.</i>	Apocynaceae	Oleander	Kabirei
15.	<i>Passiflora edulis Sims</i>	Passifloraceae	Passion fruit	Sitaphal
16.	<i>Thuja occidentalis L.</i>	Cupressaceae	White Cedar	Leirik Heibi
17.	<i>Yucca gloriosa L.</i>	Asparagaceae	Spanish dagger / Mound lily	Yerum lei

Table 4: Grassland Flora of Waikhom Mani Girls' College Campus

Sl. No	Botanical Name	Family	Common Name	Local Name
1.	<i>Achyranthes aspera</i> L.	Amaranthaceae	Chaff - flower	Khujum - pere
2.	<i>Ageratum conyzoides</i> (L.) L.	Compositae	Goat weed	Khongjai napi
3.	<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Amaranthaceae	Alligator weed	Kabo napi
4.	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Prickly amaranth	Chengkruk tingkhang panba
5.	<i>Artemisia nilagirica</i> Pamp.	Compositae	Mugwort	Laibakngou
6.	<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Indian pennywort	Peruk
7.	<i>Chenopodium album</i> L.	Amaranthaceae	Goose foot	Monshaobi
8.	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Compositae	Love - thorn	Pakhra lukhra
9.	<i>Colocasia esculenta</i> (L.)	Araceae	Elephant ear	Paan
10.	<i>Cynodon dactylon</i> (L.) Pers.	Compositae	Bermuda grass	Tingthou
11.	<i>Cyperus rotundus</i> L.	Cyperaceae	Nut sedge	Sembang kaothum
12.	<i>Dactyloctenium aegyptium</i> (L.) Willd.	Compositae	Crowfoot grass	Pungphai
13.	<i>Dichrocephala integrifolia</i> (L. f.) Kuntze	Compositae	Bicolor button weed	Lallukok
14.	<i>Eclipta prostrata</i> (L.) L.	Compositae	False daisy	Uchi sumbal
15.	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Snake weed	Pakhang leiton
16.	<i>Gynura bicolor</i> DC.	Compositae	Okinawan spinach	Tera paib
17.	<i>Hydrocotyle javanica</i> Thunb.	Araliaceae	Java pennywort	Lai Peruk
18.	<i>Leucas aspera</i> (Willd.) Link	Lamiaceae	Common leucas	Mayang lebum
19.	<i>Mimosa pudica</i> L.	Leguminosae	Sensitive plant	Kangphal ekaithabi
20.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Wood sorrel	Yensil
21.	<i>Ranunculus scleratus</i> L.	Ranunculaceae	Indian buttercup	Kakyella (Kakyel khujin
22.	<i>Rorippa indica</i> (L.) Hiern	Brassicaceae	Water cress	Uchi hanggam
23.	<i>Sida rhombifolia</i> L.	Malvaceae	Jelly leaf	Uhan
24.	<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	Chickweed	Yerum keirum
25.	<i>Urena lobata</i> L.	Malvaceae	Congo jute	Sampakpi macha
26.	<i>Xanthium strumarium</i> L.	Compositae	Cockle bur	Sampakpi achouba
27.	<i>Zehneria scabra</i> Sond.	Cucurbitaceae	Wild hops	Lam thabi

The floral density and diversity of the campus support a large number of faunal forms of both aquatic and terrestrial ecosystems. A total of 40 animal species could be observed during the present audit. The faunal diversity (Table 5) of Waikhom Mani Girl's College Campus, Thoubal has been studied and recorded/documentated as:

Table 5: Fauna of Waikhom Mani Girls' College Campus

Sl. No.	Scientific Name	Common Name	Local Name
1.	<i>Hirudinaria granulosa</i>	Leech	Timpha
2.	<i>Pharetima elongata</i>	Earthworm	Tinthrok
3.	<i>Julus londinensis</i>	Millipede	Lai shagol
4.	<i>Scolopenda subspinipes</i>	Centipede	Nachan
5.	<i>Belostoma indicum</i>	Giant water bug	Naosek
6.	<i>Berossus pulchellus</i>	Aquatic beetle	Tharaikokpi
7.	<i>Lethocerus indicus</i>	Giant water bug	Naosek
8.	<i>Nepa cinerea</i>	Water scorpion	Haonaosek
9.	<i>Sandracottus manipurensis</i>	Aquatic beetle	Tharaikokpi
10.	<i>Aeshna cyanea</i>	Dragon fly	Charang
11.	<i>Anopheles stephensi</i>	Mosquito	Kang
12.	<i>Apis indica</i>	Honeybee	Hayingkhohi
13.	<i>Aranea</i> sps.	Spider	Mirang
14.	<i>Carausius morosus</i>	Stick insect	Cheitek tin
15.	<i>Ephemera</i> sps.	Black butterfly	Kurak
16.	<i>Melanopus spretus</i>	Grasshopper	Koujeng
17.	<i>Periplaneta orientalis</i>	Indian cockroach	Kharmi
18.	<i>Rhaphicera satricus</i>	Butterfly	Kurak
19.	<i>Schistocerca gragaria</i>	Locust	Koujeng
19.	<i>Termes</i> sps.	Queen termite	Leishau mapi
20.	<i>Achantina achantina</i>	Giant African land snail	Moreh tharoi
21.	<i>Arion vulgaris</i>	Slug	U - kakphei
22.	<i>Pila globosa</i>	Freshwater snail	Labuk tharoi
23.	<i>Bufo melanosticus</i>	Common toad	Hangoi borobi
24.	<i>Polypedates leucomystax</i>	Banana frog	Hangoi tangsang
25.	<i>Naja naja kouthia</i>	Monocelid cobra	Kharou
26.	<i>Calotes versicolour</i>	Garden lizard	Numit yungbi
27.	<i>Hemidactylus garnoti</i>	House lizard	Chum
28.	<i>Typhlops diardii</i>	Worm snake or blind snake	Timunapun
29.	<i>Bungarus fasciatus</i>	Banded krait	Linkhak

30.	<i>Macropygia unchall</i>	Bartailed cuckoo dove	Lam khunu meiraang
31.	<i>Acridotheres grandis</i>	Orange billed jungle myna	Chonga amubi
32.	<i>Acridotheres tristis</i>	Common myna	Chonga angangbi
33.	<i>Pycnonotus jocosus</i>	Red - whiskered bulbul	Khoining
34.	<i>Passer domesticus indicus</i>	House sparrow	Sen - daang
35.	<i>Pycnonotus jocosus</i>	Red - whiskered bulbul	Khoining
36.	<i>Felis catus domesticus</i>	Domestic cat	Houdong
37.	<i>Rattus norvegicus</i>	Brown rat	Uchi
38.	<i>Rattus rattus</i>	Common Indian black rat	Bora uchi
39.	<i>Rhinolophus luctus</i>	Horse shoe bat	Shekpi
40.	<i>Xenochrophis piscator</i>	Checkered keelback or water snake	Lillabob

- (D) Pollution: There is very low chances of pollution from outside as there are no commercial as well as the industrial actives are running near the campus, as the campus is rich in greenery. There is no sound generating activities near the college campus the chances of noise pollution seems to be quite below of standard limit. There is no other source of noise pollution in the campus.
- (E) Water Resource and Management: College has its own water harvesting tank and pond for meeting its water requirements for various purposes such as drinking, use in washrooms, canteen and gardening. Since the College does not have staff quarters at present in the college premises, thus, no household domestic water demand, water consumed in the college premises is for drinking, sanitary and gardening purposes. The audit team did not find any leakage in the taps of washrooms and in other areas. The water from water harvesting tank is lifted to overhead tanks through an electric motor. In view of the open entry, water quality is tested (Table 6) and given below:

Table 6: Water Quality test of the water bodies

S. No	Parameter	Water Harvesting Tank	Pond	Healthy water range (given by EPA 2017)
1.	pH	8.1	7.7	6.5 - 8.5
2.	DO (mg/l)	6.08	6.68	6.5 - 8
3.	BOD (mg/l)	2.73	4.56	2 - 8
4.	COD (mg/l)	7.89	12.62	Less than 20mg/l
5.	Hardness (mg/l)	170	140	Soft 0 to <60mg/l Medium hard 60 to <120mg/l Hard 120 to <180 mg/l
6.	Alkalinity (mg/l)	185	126	20 - 200
7.	Chloride (mg/l)	102	117	Maximum level of 250mg/l
8.	Conductivity (µS/cm)	204	450	200 - 800

From the table it can be concluded that two water bodies fall in healthy ranges and it also indicated that the campus is free from pollution.

- (F) Energy Consumption and Management: Electricity is mainly needed for lighting the rooms, cooling the rooms in summer and heating the rooms in winter and running computer systems. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices. An old

incandescent bulb uses approximately 60W to 100W while an energy efficient light emitting diode (LED) uses only less than 10 W. The college has install solar panels in the college to conserve energy. Apart from this, college 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. The average electricity consumption of the college per month is approximately Rs.22000.00 per month is paid by the college for Electricity. In addition to this, there are diesel generators installed for meeting energy requirement during power cut off.

- (G) Waste Disposal and Management: Both biodegradable as well as non - biodegradable wastes are generated from various departments/sections of the college. The principal waste includes paper, grasses, electronic wastes, canteen waste and other solid wastes. Whereas, plastic wastes is completely or strictly banned in the college campus. However, following provisions have been made: i. Biodegradable: There are two kinds of dustbins (Red and Blue) placed at different places/department/sections to collect the waste separately (blue for biodegradable and red for non - biodegradable). Thereafter, the biodegradable waste produced from various departments, sports ground or other areas is put into compost pits for making compost to use in manuring garden plants and seedling planted during planting season. (ii) Non - Biodegradable: There is very low quantity of non - degradable waste in the campus as the college does not have staff quarters at present in the college premises, therefore, no household domestic waste is generated. However, rest of the nondegradable waste generated from places/department/sections of the college is collected in red dustbin and sent for the disposal through waste collection vehicle iii. E - Waste: Besides the above wastes there are another category of waste is E - waste which includes computers, laptops, pen drives, printers, hard discs, CD's and other solid waste, electrical & electronics equipment's generated through different department/sections is disposed and managed by the ICT, maintenance and store department of the college and the details are properly maintain in the stocks register.
- (H) Environmental Awareness: The college staffs is aware of the various environmental issues and the various green measures to be adopted in office as well as in their houses. A course on Environmental Studies is compulsory for all under graduate students. Further, college conducts plantation drives in the campus during Van - Mahotsav, Environment Day, 13th August and

during other important events in the college. Further, college has also adopted nearby villages for environmental awareness activities, health camps and other community programmes being conducted through their participation.

- Mitigation and Management Practices: At present following practices for environmental protection are also being adopted by the college:
- Plantation Drives: Plantation drives are regular activities in the campus, and usually in all important occasions, plantation activity is taken up. College has maintained a garden in which different medicinal and ornamental plants have been raised.
- Organic Composting and Vermicompost: The activity of making organic compost has been initiated in the campus where all the biodegradable waste materials 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.
- Energy Conservation efforts: Non - LED bulbs are not used in the College and have been replaced with LED bulbs for more efficient power utilization. More than 80% of lightening accessories are based on LED only on the campus.
- Cleanliness Drive: Cleanliness drives are carried out by all the departments and centres of the college to maintain proper hygiene and sanitization in the departments and campus.
- Water Conservation Measures through Water Harvesting Tank: Globally, our water resources are depleting each year. Additionally, we cannot generate artificial water and must depend on water sources available on our planet earth. In this context, to reduce dependency of water from tubewell and also to recharge underground water resources, the college adopted one of the simplest and best measures for conserving water. The college had created a water harvesting tank in the campus. It is a simple strategy by which rainfall is stored for future usage. The process involves collection and storage of rainwater with help of artificially designed systems, that runs off natural or man - made catchment areas e. g. rooftop, compounds, rocky surface, artificially repaired impervious/semi - pervious land surface. The collected rainwater from surfaces on which rain falls may be filtered, stored and utilized in different ways or directly used for recharge purposes. The use of a rainwater harvesting system provides excellent merits. This simple water conservation method can be a boost to an incredible solution for water conservation in the campus. It provides the most sustainable and efficient means of water management.

3. Conclusion and Recommendation

Environment audit of any academic institution reveals, ways by which institute can reduce energy consumption, water use and reduction in emission of carbon dioxide in the environment. It is a process to look into and ask ourselves whether we are also contributing to the degradation of the

environment and if so, in what manner and how we can minimize this contribution and bring down to zero and preserve our environment for future generation. This process of Environment audit enables us to assess our life style, action and assess its impact on the environment. Environment auditing is the process of identifying and determining whether institutional practices are eco - friendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources, viz., energy, water, chemicals are become habitual for everyone especially, in common areas. Now, it is necessary to check whether our activities are consuming more than required resources? Whether we are handling waste carefully? 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 it in to green and clean one.

- Reviews periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Give scientific names, common English names and local names to the newly planted species of trees.
- A separate herbal medicinal plants garden could be developed in the campus as the State of Manipur is included under Indo - Burma Hot Spot of Biodiversity (one of the 34 Hot Spots of Biodiversity of the world).
- Promote environmental awareness as a part of course work in various curricular areas, encourage independent research projects, and community service.
- Create awareness on environmental sustainability, importance of trees, conservation of medicinal plants and takes actions to ensure environmental sustainability.
- As an outcome efforts will be made to reduce carbon foot prints by using electrical vehicles in the campus, and green computing in the administration and examination.
- More fruit bearing trees should be planted in the campus to encourage nesting by the visiting avi - fauna.
- An aquarium with local ornamental fishes could be installed at the Zoology Department.
- The college needs to evaluate power usage efficiency by suitable measurement & monitoring of (a) total connected load segregated in lighting, AC's, fans and other utilities (b) developing operational controls to switch off lights, fans and AC's when rooms / classrooms are unoccupied. Conversion process of all the bulbs into LED is undergoing with a motto to save energy.
- Focus to assess the consumption of energy, electricity, water as well as disposal of liquid waste, solid waste, hazardous waste, e - waste and an inventory of trees in the campus is also prepared to check how much CO₂ is sequestered and O₂ is released.
- Various awareness programmes will be helpful to motivate all the staff members for optimized sustainable use of available resources.
- The long term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issue.
- The Environment audit Report on environment must reach the public so that it would succeed in reducing the environmental issues and its popularization among stakeholders.

- If possible an environmental audit report must be published annually by the college.
- Government can play significant role for environmental legislation and quality adoption of cleaner and environmentally benign technologies in Government organizations.

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