

Govt. Khawzawl College Environmental management sub-committee took initiatives on audits related to Green Audit, Air Quality Assessment, Land used Audit, Noise Level Audit, Water Audit and Energy Audit. Reports of the committees are highlighted below;

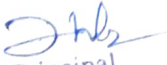
1. GREEN PROGRAMMES: The institution organizes various environmental programmes through clubs and committees. Activities like cleanliness drive, plantation programme, institution also observed various environmental days like Earth Day, World Environment Day, Green Mizoram Day, Awareness campaign on Water Conservation etc. Further, Environmental management sub-committee conducted Awareness Campaign on water conservation, Identification of Different tree species within the campus, Shrubs in the campus, Climber in the college campus, Climber in the college campus and identified flora and fauna of the campus.



Environmental Management are thoroughly studied and scrutinized. Govt. Khawzawl College has undertaken a commendable and recommendable effort in addressing its environment impact/ effect. The present report shows that there is ample scope for improvement on various grounds and thus, tackling these loopholes can be managed through continuous monitoring and practice of action plans.

Remarkable practices:

1. The institution is plastic free zone
2. The campus runs on solar power and 80 % of its energy consumption is generated from this solar energy plant
3. The street lights installed in and around the campus are all solar energy
4. Rain water is harvested
5. Paper recycling is practiced and promoted among the students.
6. Buildings are built and designed in such a way that is well lit and well ventilated


Principal
Govt. Khawzawl College
Khawzawl, Mizoram

2. AIR QUALITY ASSESSMENT:

Being a newly created district, Khawzawl District has not yet been included in the list of ambient air quality data of Mizoram. However, Khawzawl is located only 41.5 km away from Champhai and was earlier a part of Champhai District. Therefore, with Champhai (Kahrawt, Vengthlang) having an Ambient Air Quality below the National Standard of $60 \mu\text{g}/\text{m}^3$ for RSPM, $40 \mu\text{g}/\text{m}^3$ for NO_2 and $50 \mu\text{g}/\text{m}^3$ for SO_2 , it is safe and sound to assume that Khawzawl has a negligible amount of air pollutants with a much lesser population and vehicular movements as compared to Champhai.

As per the data reported by the Pollution Control Board of Mizoram, it can be concluded that the institution of Government Khawzawl College have a low SPM, RSPM, NO_2 and SO_2 . Along with the air quality standards given by NAAQS and WHO, the pollutants values obtained are all within the standard level.

Measures taken by the college to improve air quality

- Burning of solid waste is prohibited inside the college campus. Bio -degradable solid waste are collected in vermicomposting pits.
- Use of fuel wood and incinerators are prohibited, which adds to the ambient quality of air in the campus.
- The pollutants released from the vehicles are trapped by the green leaves of the thick shade of the campus, which gradually decreases the pollutants as trees are planted systematically.
- Students and Staffs of the college having a vehicle are requested to have a Pollution Under Control (PUC) Certificate for their vehicles provided by the Mizoram Pollution Control Board.
- Unending these processes, the institution can maintain its air quality and lessen air pollution problems.

Carbon Foot Print Analysis of the college

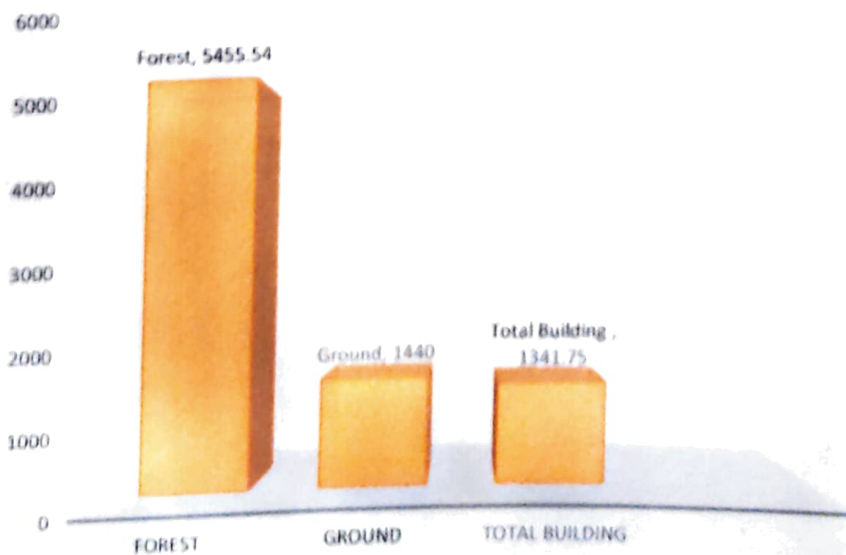
- Total number of vehicles used by the stakeholders of the college: **24**
- No: of two wheelers used: **12**
- Average distance travelled: 1km /day
- Average quantity of fuel used: 0.10 litre/vehicle
- No. of cars used: **12**
- Average distance travelled: 1 km / day
- Average quantity of fuel used : 0.20 litre/ day (per car)
- No of persons using public transportation: **4**
- No. of persons using college conveyance: **100**
- No. of generators used per day: none
- No. of LPG cylinders used in canteen/ Labs: **1**
- Use of any other fossil fuels in the college: None


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3. LAND USED AUDIT: To acquire the land use data of the institution, GPS points and Google Map data for Geo referencing have been used. Supervised classification was carried out with the aid of ground truth data collected during field survey. Creation of GIS output in the form of land use map showing various land use have been prepared for the land coverage of the institution.

The total area coverage of Govt. Khawzawl College is 18132.63 sq. m. Depending on data analysis Govt. Khawzawl College campus land use can be listed below.

Sl. No	LAND USE	AREA COVER (Sq. meter)
1.	Area of College Land	12444.69
2.	Women Hostel	149
3.	Administrative Building	139.35
4.	Students' Common Room	56
5.	Canteen	67
6.	Ground	1440
7.	Main Building	698
8.	New building coverage	232.4
9.	Total Forest Cover	5455.54
	TOTAL AREA COVERAGE (1+8+9)	18132.63



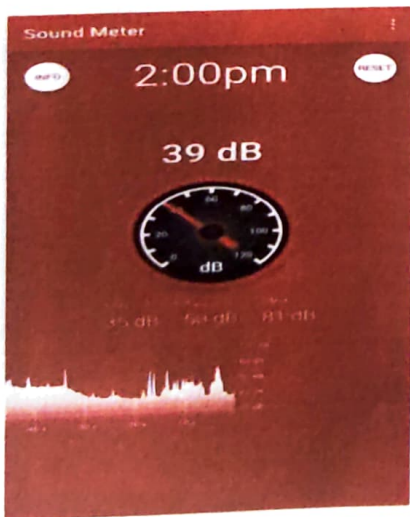
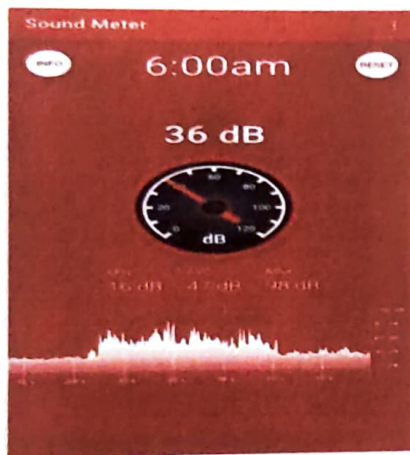
Land use coverage of Govt Khawzawl College

J. H. S.
Principal

4. NOISE LEVEL AUDIT: Government Khawzawl College is located in an area which is quiet and serene, with limited vehicular movement.

The noise level on the college campus was measured at various time intervals using a sound meter application. The application can detect all the surrounding noise and show the minimum, average and maximum level of the noise recorded. The noise level on the college campus was found to be within safety standards. This shows that the campus is quiet and serene with as little noise disturbance as possible, which makes for a good academic environment.

The sound decibel level of the campus was measured in hourly which is shown below in picture



5. **WATER AUDIT:** Water audit of the institution has been taken with the supervision and cooperation of Public Health Engineering Department, Khawzawl district.

Water Management Sources of water:

- Water supply from Public Health Engineering Department (Main Source)
- Rainwater

Monthly Consumption:

Average monthly consumption of water – 30,000 litres approx. Average annual consumption of water – 3,60,000 litres approx.

Measures undertaken for the conservation of water:

- Proper maintenance of tanks, taps and faucets used in the administrative buildings and quarters to minimize the leakage of water.
- Rooftop Rainwater harvesting is utilized in the campus on a small scale. Efforts are also being undertaken to make the college self –sufficient on water by upgrading the rainwater harvesting mechanisms through funding and assistance from the government.
- There are large amount of trees inside the college campus that helps to conserve water by preventing the surface run off.

Water Quality Testing

Water supplied by the government through the Public Health Engineering Department is carefully treated, checked and analysed for contaminants by the concerning department and are only supplied for public use after being tested safe for human consumption. Rainwater harvesting are collected on a periodic basis annually to analyse the safety and quality of water available for college consumption. The tested water sample of the College is proved to be potable as drinking water by the Public Health Engineering Department.



GOVERNMENT OF MIZORAM
PUBLIC HEALTH ENGINEERING DEPARTMENT

WATER ANALYSIS REPORT

Sample No : KZL Phed Lab/2022-2023/535
Name of Source : Rain Water Harvesting
Detailed Location : Govt Khawzawl College
Type of Source : Rain Water
Date & Time of Collection : Dt 5.05.2022 (Thursday)
Name of Collector : K. Lalkathpura, Asst.Prof
Date of Analysis : Dt 5.05.2022 (Thursday)
Name of R.D Block : Khawzawl R.D Block

1. Physical Characteristics

	Result of Analysis	I.S.Specification for Drinking IS-10500 :1992	
		Desireable Limit	Permissible limit in the absence of alternate source
1 pH	7.0	6.5 - 8.5	-
2 Odour	Odourless	unobjectionable	-
3 Taste	Tasteless	agreeable	-
4 Colour	Colourless	unobjectionable	-
5 Turbidity (in NTU)	1.10 NTU	5.0	10.0
6 Electrical Conductivity (in micro mhos/cm)	150/26.7°C	500.0	1500.0
7 Total Dissolved Solids (in mg/l)	110	500.0	2000.0

2. Chemical Characteristics (inmg/l) :

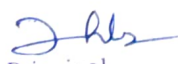
1 P. Alkalinity	Nil	-	-
2 M. Alkalinity	20.0	-	-
3 Total Alkalinity	20	200.0	600.0
4 Total Chloride	30.0	250.0	1000.0
5 Total Hardness	75.0	300.0	600.0
6 Total Iron	0.0 ppm	0.3	1.0
7 Residual Chlorine	Absent	(No Colour-A)	(Blue Colour-P)

3. Bacteriological Characteristics :

1 Total Coliform (MPN per 100 ml of Water Sample)	0	3.0	10.0
2 Fecal Coliform (MPN per 100 ml of Water Sample)	-	0.0	-
3 P.A Test	Absent	0.0	-


(VANIMUNTIANA VARTE)

Chemist
Sub - Divisional Lab, PHED
Khawzawl WATSAN Sub - Division


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6. ENERGY AUDIT:

An energy audit is an inspection and analysis of energy flows in a building with the objective of understanding the energy efficiency home or institution being audited. It is an effective tool in defining and pursuing comprehensive energy management programmes. It helps in energy cost optimization, pollution control, environment conservation, safety aspects and suggest the method to improve the operating and maintenance practices of the system.

As a means of saving energy and reducing energy consumption, the college follows the following practices as far as possible.

- Replacing the old filaments bulb, CFL, and tube light by low energy consuming LED bulbs and LED bulbs and bulky high consuming fans by energy efficient fans in order to keep the electricity consumption of the college as low as possible.
- Power consuming CRT monitors are also replaced with energy efficient LCD monitors in all the computers used by the college.
- Used of Sleep mode over screen savers in computers.
- Using electronic devices with high star ratings for smart energy consumption.
- Construction of building with optimum utilization of Natural Light.

Besides these practices, different clubs and committees in the college also takes effort in creating awareness on the importance of saving and conserving energy among the students. The college also installed solar powered street light inside the campus.

Electrical Energy Consumption:

The details of Energy consumption are given in the table below.

Electronic Devices/Items	Nos/quantity	Total Power Output (Watts)
1 LED Bulb	28	226
2 CFLs Bulb	6	95
3 CFLs Tube-light	26	716
4 Desktop Computer	4	100
5 Printer/ Xerox Machine	3	420
6 Projector	2	348
7 Electronic water filter	2	40
8 Coffee Machine	1	25
	TOTAL	1970

From 2019, a solar energy with a generating capacity of 2×10 kwp. (2000 watts) has been installed in the college. So, this enables the college to meet its power demand 24×7

7. Waste Management:

A large amount of waste in the surroundings results in health problems. The Institution activities may produce different types of waste which requires proper treatment and disposal to prevent the environment and to increase public health. The institutions prioritize the health of the environment throughout the year, it prioritize the sustainable development for the future generation.

Various steps have been taken by the institution for proper waste management. The wastes produced by the institution are carefully segregated in the institution for proper disposal. Different waste bin for different waste are allocated in the campus. The institution wastes are mainly categorized into solid, liquid and electronic waste. Different methods were applied to dispose these wastes as mentioned below.

Liquid Waste Management:

1. The liquid waste generated in the campus is mainly Canteen waste.

Measures taken for liquid waste management:

1. The institution has a drainage system for its sewages.
2. Waste water from the toilet is collected in septic tanks located in various part of the campus.



Side drain



Segregation of waste.

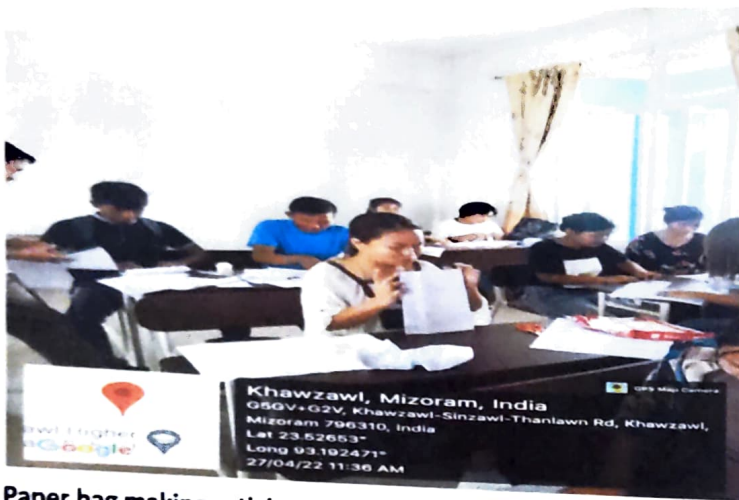
Solid Waste Management:

Solid wastes generated in the institution are mainly Canteen waste, paper waste, toiletry waste, weeds, wrappers, litter and dried tree leaves and trunks.

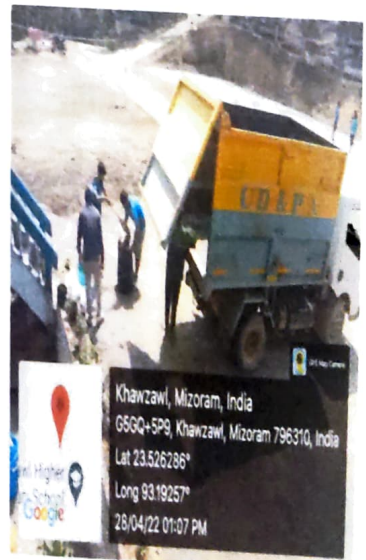
Measures taken for solid waste management:

1. Campus wastes are separated into Biodegradable and Non- Biodegradable waste.
2. Three types of waste bins are provided at campus for biodegradable, non-biodegradable and electronic waste. These wastes are managed depending on the nature of the waste. Biodegradable waste includes paper, canteen waste, weeds, litter and tree leaves and trunks.
3. Paper wastes are collected and are recycled into Paper Bags which is carried out by the student as NSS and Eco-Club activities.
4. The unused papers of the examination answer sheets are sorted out and bounded as booklets which are further used as answer sheet in the internal or class test.
5. The biodegradable waste like litter, weeds and canteen waste are dumped in an Vermicomposting Pit, which are utilised as an organic fertilizer for plantation within campus.

6. The food waste generated by the students and staffs are taken back to their home, so that, minimum waste is generated inside the campus.
7. The non-biodegradable waste like plastic, polythene, etc. are collected in separate bins which are disposed to Garbage Truck which visit the institution weekly, and are further segregated by the Department of Sanitation, Government of Mizoram for recycling process.
8. Uses of incinerators are prohibited in the campus to reduce and check the air pollution.
9. The institution is a plastic free campus.



Paper bag making activity





E- Waste Management:

When an electronic device requires a repair in the institution, the minor ones are done by the teaching and non-teaching staff. The major repairs are handled by the professional. The equipment which cannot be re-use are pack in a garbage bag for disposal.

Measures taken for E-waste management:

1. The institution assures that the E-waste does not end up in a landfill.
2. Wastes from different electronic devices are carefully collected in a separate bin and are marked e-waste and disposed of in the garbage truck of UD&PA for further management.



Report and Recommendations:

The different points with regard to Green Audit and Environmental Management were thoroughly studied and scrutinized. In this regard, it is noteworthy to say that Govt. Khawzawl College has undertaken a commendable and recommendable effort in addressing its environment impact/ effect, even though it faced many hurdles and obstacle in the process of managing and developing a compact eco-friendly campus.

It is also notable to mention herewith that these steps undertaken will further enhance and help in the development of bringing about a sustainable eco-friendly environment. The present reports shows that there is ample scope for improvement on various grounds and thus, tackling these loopholes can be managed through continuous monitoring and practice of action plans formulated which will help in attaining a better and higher status from the prevailing position or level.

Noteworthy practices:

- The institution is plastic free zone
- The campus runs on solar power and 80 % of its energy consumption is generated from this solar energy plant
- The street lights installed in and around the campus are all solar energy
- Rain water is harvested
- Paper recycling is practiced and promoted among the students.
- Buildings are built and designed in such a way that is well lit and well ventilated

Recommendations:

- Waste water management needs better designed and practice in the campus.
- Centralised Sewage treatment plant which is environment friendly may be set up to reuse all the grey water and avoid fresh water for watering plants.
- Rain garden to be made functional.
- The public lights within the campus may be run with solar panels .
- Fire safety instrument should be installed in all the buildings.
- Vehicles pooling should be encouraged in the institution and use of bicycles can be promoted.

AUDIT CERTIFICATE

This is to certify that
Government Khawzawl College
has conducted
Green Audit

For the session of 2021-2022 to assess the measures, efforts and planning carried out in the college campus. This Green Audit also aims to determine the impact of green initiative for maintenance of an eco-friendly campus.

The actions and measures taken by the college were found to be satisfactory. The initiatives undertaken by the respective faculty, management and students towards the environment and the ecosystem are highly esteemed.

Place : *Khawzawl.*

Date: *27.5.2022.*

(H. VANLALHRUAIA)

Chairman

Environmental Management Sub Committee
(Internal Auditor)

(SAMSON THANRUMA)
Divisional Forest Officer
Khawzawl Forest Division
(External Auditor)


Divisional Forest Officer
Khawzawl Wildlife Division
Khawzawl, Mizoram

Principal

Govt. Khawzawl Col.,
Khawzawl, Mizoram

2. Clean and green campus initiatives




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3. *Beyond the campus environmental promotion activities*

b) Cleanine of Tuisen River



a) Cleaning of Mualvawm field




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