

**Report on
Green Audit,
Gurukula Kangri Vishwavidyalaya,
Haridwar**



**Green Audit Cell
Gurukula Kangri Vishwavidyalaya,
(Deemed to be University u/s 3 of UGC act 1956)
Haridwar**

Preface

Self – judgement is a process required for the outgrowth of an individual or an organization. Seeing the importance of environmental degradation and rise in pollution and its causes, realization of values of environment for students, faculties and others working and residing in the campus, Green Audit cell of Gurukula Kangri Vishwavidyalaya has conducted audit of all the campuses. Aim is to record the present condition in terms of Energy Management, Water quality, Water Management, Waste Management, Landscape/environment, Built-up Environment, Transportation, Green Agenda in Syllabus, analyze it and pursue it for improving environmental quality and to make it better for future generations of students and staff.

To conduct the Green Audit, Green Audit Cell, GKV has made a self-inquiry on various parameters (broadly mentioned above) of the campus with the following objective:

- To establish a baseline of existing environmental conditions with focus on natural and physical environment
- To understand the current practices of sustainability with regard to the use of water and energy, generation of wastes, purchase of goods, transportations, *etc.*
- To promote environmental awareness through participatory auditing process
- To create a report that documents baseline of good practices and provide future strategies and action plans towards improving environmental quality for future.

As there is no standard model available for such a green audit for institutions, the committee has followed the model used by University of Kerala, Kerala, modified it in various brainstorming meetings within the committee including an external expert. The data collected and compiled and analyzed by the committee. The part which needs measurement of quality was assigned to Insect Biodiversity and Air pollution Lab. and Limnological and Ecological modeling Lab., Department of Zoology and Environmental Science, GKV, Haridwar

With the assessment of all the data collected, the committee has made short term and long term suggestions to environmental concern to its higher most level and expecting that the administration as well as all the Departments of Vishwavidyalaya consider them for GKV's better and green future.

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G.K.V., Haridwar

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Introduction

Green Audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green audit of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyse the potential duties and to determine a which can lower the cost and add to the revenue. Though Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit. Some of the incidents like Bhopal Gas Tragedy (Bhopal; 1984), Chernobyl Catastrophe (Ukraine; 1986), Exxon-Valdex Oil Spill (Alaska; 1989), have cautioned the industries that setting corporate strategies for environmental security elements have no meaning until they are implemented.

The term “Green” means eco-friendly or not damaging the environment. This can acronymically be called as “Global Readiness in Ensuring Ecological Neutrality” (GREEN). Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. Green accounting can be defined as systematic identification quantification, recording, reporting & analysis of components of ecological diversity & expressing the same in financial or social terms. “Green Auditing”, an umbrella term, is known by another name “Environmental Auditing”. The ‘Green Audit’ aims to analyze environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit.

Educational institutions have broad impacts on the world around them, both negative and positive. The activities pursued by campus can create a variety of adverse environmental impacts. But they are also in a unique position as educational institutions to be leaders in pursuing environmentally sustainable solutions.

On the occasion of **World Environment Day - 2015** an initiative was taken by Gurukula Kangri Vishwavidyalaya and expressed its commitment to sustainability while forming a committee to conduct audit of campus and its facilities. Vishwavidyalaya has taken a number of positive steps to reduce its environmental impact. But many areas remain in which substantial improvements can be made. This report serves to highlight some accomplishments of and to make recommendations for improving the campus Green and environmental sustainability.

We have focused on certain indicators, covering an extremely wide range of environmental impacts.

For each indicator, we establish a benchmark to evaluate Vishwavidyalaya's overall performance. We examine the performance of Vishwavidyalays's on each of these indicators, and offer recommendations about how the campus can reduce its environmental impact within each indicator. We hope that this report will provide an accurate snapshot of Vishwavidyalay's environmental impact at this point in time, and that it will aid the campus in prioritizing positive steps it can take to improve overall sustainability. We intend this document to be revisited annually and updated by the Vishwavidyalaya.

Significance of Green Audit

One of the major threats arising from urbanization and increase in population on earth is over-development and unmanaged utilization of resources. To monitor this there are a number of environmental management techniques that can be used to minimize the effects of development. One of the techniques associated with environmental management programmes is that of Green Audit or Environmental Auditing. The purpose of this management tool is to measure the actual and potential environmental impacts in the ecosystems.

Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being and he bears a solemn responsibility to protect and improve the environment for present and future generation." Most countries today face environmental threats due to the increase in pollution of the atmosphere, water and land. Wildlife habitats continue to be threatened. Water contamination and air pollution are critical problems facing most countries. Environment related problems are linked closely to the rapid growth of population, as well as to technological advancements.

Green auditing or environmental audit is a process of extracting information about a company that provides a realistic assessment of how the company affects the environment and also a set of environmental objectives and targets to reduce the effects. Eco-auditing is a systematic multidisciplinary method used periodically to assess the environmental performance of a project. Eco-auditing evolved as a management tool in the USA in 1980s. It has been promoted in Europe by the International Chamber of Commerce and by some multinational corporations as a means of getting effective environmental management. But, in developing countries, the eco-auditing concept is still a theoretical concept. However, India has modified its Companies Act to include a requirement for eco-audits. This it is very important for each organization to conduct it environmental audits or green audit to ensure that we are working in the direction of sustainable development.

Part I: Air Quality

Table 1: Air Quality Measurement in the campus of Gurukula Kangri Vishwavidyalaya for the two consecutive years (2014-2016)

Determinant	Unit	Value (Average)		NAAQS	Remarks
		2014-15	2015-16		
SPM	$\mu\text{g}/\text{m}^3$	148.70	156.48	60 $\mu\text{g}/\text{m}^3$ (Annual)	Exceeds limit
RSPM	$\mu\text{g}/\text{m}^3$	55.09	57.26	40 $\mu\text{g}/\text{m}^3$ (Annual)	Exceeds limit
SO _x	$\mu\text{g}/\text{m}^3$	4.65	8.51	50 $\mu\text{g}/\text{m}^3$ (Annual)	Well within limit
NO _x	$\mu\text{g}/\text{m}^3$	12.53	19.92	40 $\mu\text{g}/\text{m}^3$ (Annual)	Well within limit
Ozone	$\mu\text{g}/\text{m}^3$	3.87	5.32	100 $\mu\text{g}/\text{m}^3$ (8 hrs.)	Well within limit

SPM: Suspended Particulate Matter

RSPM: Respirable Suspended Particulate Matter

SO_x: Oxides of Sulphur

NO_x: Oxides of Nitrogen

NAAQS: National ambient Air Quality Standards

Part II: Water Quality

Table 2: Water Quality Measurement in the campus of Gurukula Kangri Vishwavidyalaya, Haridwar

Parameter →	Temp (°C)	pH	EC (µS/Cm)	TDS (mg/L)	DO (mg/L)	Chloride (mg/L)	Alkalinity (mg/L)	Ca (mg/L)	Mg (mg/L)	TH (mg/L)
↓ Sites										
S-1	21.00	7.26	533.00	283.00	6.87	73.84	195.00	160.00	29.20	189.20
S-2	21.10	7.37	559.10	293.10	5.89	68.16	172.00	175.00	34.30	209.30
S-3	20.90	7.35	716.00	383.00	9.65	71.00	190.00	190.00	22.50	212.50
S-4	20.70	6.88	356.00	189.00	8.72	59.64	100.00	126.00	26.60	152.60
S-5	21.50	7.24	723.00	385.00	8.70	76.68	143.00	160.00	31.30	191.30
S-6	21.30	7.06	734.00	396.00	8.72	79.52	104.00	210.00	32.20	242.20
Min	20.70	6.88	356.00	189.00	5.89	59.64	100.00	126.00	22.50	152.60
Max	21.50	7.37	734.00	396.00	9.65	79.52	195.00	210.00	34.30	242.20
BIS 2012	--	6.5-8.5	--	500	--	250	200	75	30	300
S-1:	Zoology and Environmental Science				S-4:	Pandit Lekhram Hostel				
S-2:	BAMS Ayurvedic College				S-5:	Deptt. Of Pharmacy				
S-3:	Kanya Gurukul Campus				S-6:	Registrar Office				

Part III: Green Cover

Green cover plays an imperative role in planning since they contribute significantly in enhancing ecological quality of particular areas, in all the entire region. It improves air quality, urban health, conserving biodiversity, reducing noise, *etc.* Removal of vegetation cover can be identified as one of the poorest effects of unorganized development. Proper distribution of green cover in any developmental activity or maintain the green cover in developed areas is consequently more inevitable for the sustainable development and healthy living. Hence, it is necessary to identify the green space requirement quantitatively and spatially.

Gurukula Kangri Vishwavidyalaya is one of the oldest institution of India committed for maintaining cultural heritage while moving towards a better future with scientific and sustainable perspective. In terms of environment, the Vishwavidyalaya is very rich with number of exotic species of plants, conservation measure of water undertaken *viz.* awareness, conservation of water from distillation assemblies *etc.*, recycling of waste to convert it into compost and vermi-compost *etc.* In recent years steps like formation of Eco-club, awareness camps and workshops, celebration days like Himalayan Day and World Environment Day while planting trees and motivated lectures are taken place within all the campuses of Vishwavidyalaya.

Conducting green audit is also another step while assessing the present condition and improve wherever is required in terms of green cover from energy conservation to water conservation, planting trees to awareness programmes.

Part IV: **Environmental Practices**

The term *environmental* practice defines the application of appropriate combination of environmental monitoring, assessing and control measures. While including it in reports it also includes the strategies or the future recommendations. The following are the sub-headings on the basis of which the current green audit of Gurukula Kangri Vishwavidyalaya conducted:

- **Energy Management**
- **Water Management**
- **Waste Management**
- **Build-up Environment**
- **Transportation**
- **Landscape/ Environment**
- **Green Agenda in syllabus**

a. Energy Management



Energy management includes planning and operation of energy production and energy consumption units. Objectives are resource conservation, climate protection and cost savings, while the users have permanent access to the energy they need. It is connected closely to environmental management “Energy management is the proactive, organized and systematic coordination of procurement, conversion, distribution and use of

energy to meet the requirements, taking into account environmental and economic objectives”.

One of initial steps for an effective energy cost assessment program is the base line energy assessment, which examines the pattern of existing energy usage by the institution. The program will set the reference point for improvements in energy efficiency. Energy efficiency can improve the existing energy usage and benchmarking of every individual department, in all the Vishwavidyalaya. It is important to integrate the energy management in the organizational structure, so that the better energy management can be implemented. Responsibilities and the interaction with the decision makers should be regularized and better plans for the Vishwavidyalaya could be designed and implemented. The delegation of functions and competencies extend from the top management to the executive staff.

During the energy audit as a part of green audit it is clearly found that there are more than 5000 number of energy consumption products which includes bulbs, air-conditioners, projectors, printers, computers and laptops, photocopiers, fans *etc.* There are many instruments and devices available in science, life science and faculty of engineering which consumes lot of energy. While assessing it was clearly found that there are a few LED lights are installed which are environmental friendly.

With the current assessment it is evident that there is a need to install large number of solar lights in the campus and replace all the CFL’s and tube lights with LED bulbs and tube lights. This will save a lot of consumption of energy.

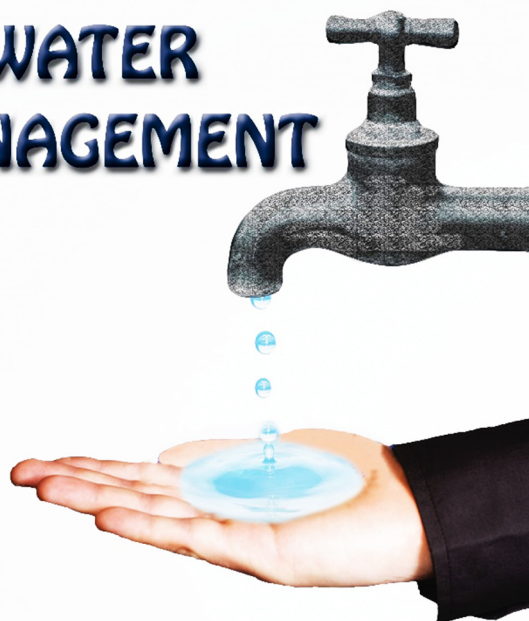
S. No.		No. of Tubes +	No. of A.C.	No. of LCD	No. of	Projectors	Photocopiers	Computer +	LEDs	Non-	Conventional	(Solar)	Energy	Management	No. of Fans
I.	MAIN CAMPUS														
1.	Department of Philosophy	3	1	1	1	1	1	2+4	2	No	No	No	Yes	Yes	6
2.	Department of Zoology & Environment Science	102+56	28	2	2	11	16+8	4	4	No	No	No	Yes	Yes	95
3.	Department of Sanskrit	39+6	11	No	No	No	Yes	Yes	Yes	No	No	No	No	No	38
4.	Department of Physics	162	22	2	2	Nil	30+7	23	23	No	No	No	Yes	Yes	150
5.	Faculty of Management Studies	150	25	6	6	1	72+12	20	20	No	No	No	Yes	Yes	50
6.	Department of Psychology	17+16	2	1	1	4	4+4	NO	NO	No	No	No	Yes	Yes	11
7.	Department of Yogic Science	76+14	3	1	1	1	7+3	14	14	No	No	No	No	No	62
8.	Department of Botany & Microbiology	135+90	21	4	4	Nil	13+11	2	2	No	No	No	Yes	Yes	48
9.	Department of Pharmaceutical Sciences	11+nil	14	1	1	No	29+7	3	3	No	No	No	Yes	Yes	128
10.	Department of Chemistry	247	15	2	2	2	38+19	Nil	Nil	Nil	Nil	Nil	Yes	Yes	110
11.	DSW	2+1	1	N/A	N/A	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	1
12.	Swami Shradhanand Hostel	214		No	No	No	2+1	20	20	No	No	No	Yes	Yes	214
13.	Pt. Lekha Ram Hostel	82+45	No	No	No	No	No	No	No	No	No	No	No	No	64
14.	Pt. Guru Dutt Vidhyarthi Hostel	500+50	No	No	No	No	20 + 2	12	12	No	No	No	No	No	180
15.	Corporate Affairs & Outreach Cell (CAOC)	20	2	1	1	2	2+2=4	No	No	No	No	No	Yes	Yes	11
16.	Senate Hall (Guest House)	210+40	38	1	1	1	1	1	No	No	No	No	No	No	92

17.	Central Office	88+20	25	02	6	45+22	20	No	Yes	44
18.	Vice Chancellor's Office	22+10	4	01	01	2+2	02	No	Yes	06
II.	KGC, Haridwar									
1.	Environmental Science	55+10	2	1	1	3	No	No	Yes	39
2.	Physics	29	1	1	No	2	No	No	No	22
3.	Microbiology	73	1	2	No	2+1	No	No	No	42
4.	Chemistry	73	1	1	No	2+1	No	No	No	42
5.	Ancient Indian History Culture & Archaeology	13+1	No	No	No	1	No	No	No	13
III.	FET, Haridwar	630	48	4	1	270+31	20	2	No	524

b. Water Management



**WATER
MANAGEMENT**



Water management is the control and movement of water resources to minimize damage to life and property and to maximize efficient beneficial use. Water management means dealing with water in the best possible way. This can be done by authorities or it can be done by individuals. Good water management will involve organizing water so that everyone has enough, and controlling water supplies and water treatment center's so that they work in the best possible way. It thus often involves some knowledge of the chemical properties of water. Water management affects many aspects of our lives. Water is so common that we often do not think about where it comes from or where it is managed. But, bad water management can really hit us hard. Below are some key ways in which water management is important.

Drinking water: Humans need to drink around 8 glasses of water a day in order to get sufficient hydration. So clean drinking water is a necessity for us. Without water, we can only survive for a few days at most. But, if we have water and no food, we can survive for several weeks. This shows just how crucial it is that we have daily access to clean water that is suitable for drinking. If we have pets, they will need daily access to water too.

Biodiversity: Managing water well ensures that we do not deplete or contaminate rivers, lakes and other important water sources which are habitats for a wide range of birds, mammals, fish, reptiles and amphibians as well as water dwelling plants.

Conserving water: Staff and students can conserve many gallons of water every day, simply by not running taps or using water-guzzling appliances unnecessarily. Water can also be conserved by generally consuming less. Not many people realize how much water goes waste. Cutting down on the

amount of things that we buy can really reduce the amount of water that is needed to support our lifestyle.

There is no denying that easy access to fresh, clean, safe water is a right that all humans should enjoy. However, in many parts of the world, people have to walk many miles in order to access clean water. So, good water management systems are only truly praiseworthy if they are implemented throughout the world so that everyone can benefit from them. Good water management means not just a convenient and safe water supply for some people – but water for everyone to use.

During the water audit as a part of green audit it was found that there is a consumption of more than 10000 lit./day This includes gardening, drinking, laboratory use, toilet use, hostel mess cooking, canteen water supply *etc.* While assessing it was found that there are some management practices are in use like water conservation awareness, display boards for water conservation, repairing of leaking points. However there is a strong need to be developed rain water harvesting system in Vishwavidyalaya on larger scale.

It is highly recommended that the rainwater harvesting practice should be applied in the campus and reuse of water from distillation assembly should be practice by all the departments. There is a major requirement of awareness of water conservation drive required for campus staff as well as for students to make them understand regarding the benefits and ways of water conservation inside the campus, in hostels and recycling of sewage or installation of sewage treatment plant is recommended while using its water in gardens and for flushing in toilets.

Although at present the condition of water quality is found suitable for drinking and for other uses but for the benefit of future students and faculties it is must to improve within time.

S. No.		Wise use of Water	Water leakage Repair	Use of Water Purification	Rain Water Harvesting	Use of Water Cooler	Water Pollution	Water Use per day in Liters	Water Storage	Water Tank Cleaning	Water Management Practice
I.	MAIN CAMPUS										
1.	Department of Philosophy	Yes	Yes	Yes	No	Yes	No	50	500	Yes	Yes
2.	Department of Zoology & Environment Science	Yes	Yes	Yes	Yes	Yes	No	100	Yes	No	No
3.	Department of Sanskrit	Yes	Yes	Yes	No	No	No	1500	No	No	No
4.	Department of Physics	Yes	Yes	Yes	No	Yes	No	1000	Yes	Yes	Yes
5.	Faculty of Management Studies	Yes	Yes	Yes	No	Yes	No	600	Yes	Yes	No
6.	Department of Psychology	No	No	No	No	No	No	20	No	No	Yes
7.	Department of Yogic Science	Yes	Yes	Yes	No	Yes	No	120	250	Yes	No
8.	Department of Botany & Microbiology	Yes	No	Yes	No	Yes	No	1500	2000	No	Yes
9.	Department of Pharmaceutical Sciences	Yes	Yes	Yes	No	Yes	No	1000	Yes	Yes	No
10.	Department of Chemistry	Yes	Yes	Yes	No	Yes	No	1.5 kl	10 kl	Yes	Yes
11.	DSW	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a
12.	Swami Shradhanand Hostel	Yes	Yes	Yes	No	Yes	No	500	Yes	Yes	Yes
13.	Pt. Lekha Ram Hostel	Yes	Yes	Yes	No	Yes	No	1000	Yes	Yes	Yes
14.	Pt. Guru Dutt Vidhyarthi Hostel	Yes	Yes	Yes	No	Yes	No	2000	Yes	Yes	Yes
15.	Corporate Affairs & Outreach Cell (CAOC)	Yes	No	Yes	No	Yes	No	5	Yes	No	Yes
16.	Senate Hall (Guest House)	Yes	Yes	Yes	No	Yes	No	Depend on Occupancy	Yes	Yes	Yes

17.	Central Office	Yes	Yes	Yes	No	1200	Yes	Yes	Yes
18.	Vice Chancellor's Office	Yes	Yes	Yes	No	800	Yes	Yes	Yes
II.	KGC, Haridwar								
1.	Environmental Science	Yes	No	Yes	Through campus land	1000	Yes	Per year	Yes
2.	Physics	Yes	No	Yes	No	10	No	Yes	No
3.	Microbiology	Yes	Yes	Yes	No	2000	Yes	Yes	No
4.	Chemistry	Yes	Yes	Yes	No	2000	Yes	Yes	No
5.	Ancient Indian History Culture & Archaeology	Yes	No	Yes	No	10	No	No	Yes
III.	FET, Haridwar	Yes	Yes	Yes	No	600-800	Yes	Yes	Yes

c. Waste Management



Waste management or waste disposal are all the activities and actions required to manage waste from its inception to its final disposal. This includes amongst other things collection, transport, treatment and disposal of waste together with monitoring and regulation. Waste can take any form that is either solid, liquid, or gas and each have different methods of disposal and management. Waste management normally deals with all types of waste whether it was created in forms that are industrial, biological, household, and special cases where it may pose a threat to human health. It is produced due to human activity such as when factories extract and process raw materials. Waste management is intended to reduce adverse effects of waste on health, the environment or aesthetics.

During the waste audit it is clearly found that there is a major upgradation is required in the Vishwavidyalaya regarding the waste management. Various types of waste coming out in terms of garbage from departments, leaf litters, food waste from canteen and hostel mess and chemical waste are some of the major waste available in the campus. Although the chemical waste is dumped into the put in the ground but it is found to be wrong practice as it will cause soil and ground water pollution, in campus the ground water is major source of pollution so it required major attention. Another waste which require is microbial waste, although it is in small amount only from Department of Microbiology and Pharmaceutical sciences but it also required major attention. The practice of vermi-composting is going on in the main campus of Vishwavidyalaya but it has to be initiated in other campuses also. The step taken to recycle food waste as purchase of composting machine is highly appreciable and recommended.

With the current assessment it is clearly found that entire Vishwavidyalaya requires major attention for waste management specially the recycling or the dumping of waste. The initiation of Swachh Bharat Dry and Wet Bins are highly appreciated and it is recommended that authorities should try to connect with District Municipal Cooperation to collect the waste from all the campus and pollution District pollution control authorities for chemical, microbial pharmaceutical and medical waste from all the campuses. There is a major requirement of awareness of water conservation drive is also required for campus staff as well as for students to make them understand regarding the benefits and ways of waste management inside the campus, in hostels and into their living nearby areas.

S. No.		Food/Organic Waste/Day (Kg)	Non-Plastic dry Waste/day (Kg)	Plastic, Thermocol/Day	Other (E-waste)	Management of Organic Waste	Management of Other Waste	Waste dumping Pit?	Waste management Practices
I.	MAIN CAMPUS								
1.	Department of Philosophy	N/a	1	N/a	N/a		Yes	No	
2.	Department of Zoology & Environment Science	No	5	No	No		Chemical dumped in dumping pit	Yes	
3.	Department of Sanskrit	1	1/2	No	No		No	No	
4.	Department of Physics	1	1	250 gm	No		No	No	
5.	Faculty of Management Studies	1/2	No	No	No		No	No	
6.	Department of Psychology	No	No	No	No		No	No	
7.	Department of Yogic Science	1	3	50gm	20gm	Yes	No		Yes
8.	Department of Botany & Microbiology	6	1/2	50 gm	50 gm		Microbial material dumped in dumping pit	No	
9.	Department of Pharmaceutical Sciences	1	2	1/2	1/2		Yes	Yes	
10.	Department of Chemistry	2	6	0.5	No		Chemical dumped in dumping pit	Yes	
11.	DSW	N/A	N/A	N/A	N/A		N/A	N/A	
12.	Swami Shradhanand Hostel	5	8	No	No		No	Yes	

13.	Pt. Lekha Ram Hostel	10	10	No	No	No	No	No	Yes	
14.	Pt. Guru Dutt Vidhyarthi Hostel	10	10	No	No	No	No	No	Yes	
15.	Corporate Affairs & Outreach Cell (CAOC)	No	No	No	No	No	No	No	No	
16.	Senate Hall (Guest House)	Depend on Guest House Occupancy	Depend on Guest House Occupancy	No	No	No	No	No	No	
17.	Central Office	No	1 Kg	1 Kg	500 gm			Yes	Yes	
18.	Vice Chancellor's Office	No	500 Kg	250 gm	No			N/A	Yes	
II.	KGC, Haridwar									
1.	Environmental Science	1 Kg	3 Kg	250 gm	No			Chemical dumped in dumping pit	Yes	
2.	Physics	1 Kg	YES	250 gm	No			No	YES	
3.	Microbiology	Yes	Yes	Yes	No			Microbial material dumped in dumping pit	Yes	Yes
4.	Chemistry	Yes	Yes	Yes	No			Chemical dumped in dumping pit	Yes	
5.	Ancient Indian History Culture & Archaeology	No	No	No	No			No	Yes	
III.	FET, Haridwar	7	20	Nil	Yes			Yes pit	Yes	

d. Build-Up Environment



The term **built environment**, or **built world**, refers to the human-made surroundings that provide the setting for human activity, ranging in scale from buildings to parks. It has been defined as “the human-made space in which people live, work, and recreate on a day-to-day basis”. An accessible physical environment benefits everyone, not just persons with disabilities. Measures should be undertaken to eliminate obstacles and barriers to indoor and outdoor facilities including schools, medical facilities, and workplaces. These would include not only buildings, but also footpaths, curb cuts, and obstacles that block the flow of pedestrian traffic. An accessible government building is one, where persons with disabilities have no barrier in entering it and using all the facilities therein. This covers the built environment – services, steps and ramps, corridors, entry gates, emergency exits, parking – as well as indoor and outdoor facilities including lighting, signages, alarm systems and toilets.

Identifying accessible buildings requires annual accessibility audits that determine if a building meets agreed upon standards. Once a building is deemed fully accessible, an annual audit is not necessary, but should be required for any proposed changes to the structure or systems contained therein. A full audit can then be done on a less frequent basis. Standards of accessibility should be as consistent as possible with international standards, such as those of the ISO, taking into account the local context. In regards to the built environment, ISO 21542:2011, Building Construction – Accessibility and Usability of the Built Environment, delineates a set of requirements and recommendations concerning construction, assembly, components and fittings.

While these things in mind the audit for build-up environment, we assessed all the infrastructure the Vishwavidyalaya have in all the campuses, having mixed infrastructure from old to new. Almost all the building are having plantation and green cover around them. In terms of safety almost all the departments are having Fire extinction system installed. With the earlier initiatives of Green audit

cell, eco-club and authorities the campus is almost free from noise pollution inside the campus but a minimum was there due to Vishwavidyalaya campus are situated on the National Highways.

In many departments it was found that there are no rest rooms for females as well as differently abled persons in the main campus and Faculty of engineering. In Kanya Gurukul campus in Haridwar as well as Dehradun of Vishwavidyalaya there is no facility available for men and differently abled persons. It is highly recommended that as per the Govt. norms there must be restroom facilities for every type should be there in all the organizations. In some department facilities like ramp for differently abled persons are not available and as per the govt. norms it has to be developed to give equal rights to all the persons. Another major thing required for the development of students' knowledge and constructive thinking is recreation room. We suggest and recommend a common recreation room inside each campus to be created for all the students.

With the current assessment it is clearly found in the build-up environment there are certain things which require upgradation and maintenance. We also recommend that all the conferences halls available in the different departments should be given some name of eminent researchers of the respective fields or eminent alumni's of the Vishwavidyalaya and there biography with a photograph should be there in the conference hall. It will lead to students more aware about the researchers of India and great alumni's of Vishwavidyalaya.



S. No.		Building Types	Area in Sq. ft	Eco-Friendliness	Fire prevention provisions	Aesthetic appeal	Serinity of Class rooms	Ladies Rest Room	Recreation Room	Provision for differently abled	Toilets, Men, Women, differently abled	
I.	MAIN CAMPUS											
1.	Department of Philosophy	Old	200	Yes	No	Yes	Yes	Yes	No	Yes	Yes	
2.	Department of Zoology & Environment Science	Old & new	7000		Yes	Yes	Yes	Yes	No	No	No	Yes
3.	Department of Sanskrit	Old & New (Combined)	3400		No	Yes	Yes	Yes	No	No	No	Yes
4.	Department of Physics	Office & Class Room	2785.75		No	Yes	Yes	Yes	No	No	Yes	Yes
5.	Faculty of Management Studies	RCC	24175.75		Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
6.	Department of Psychology	Brick Building	2516		No	Yes	Yes	Yes	No	No	Yes	Men toilet
7.	Department of Yogic Science	Old & new	1000		No	No	Yes	Yes	No	No	No	Men toilet
8.	Department of Botany & Microbiology	Old & new	3200		Yes	Yes	Yes	Yes	Yes	No	YES	1+1
9.	Department of Pharmaceutical Sciences	Concrete	42797		Yes	Yes	Yes	Yes	No	No	No	No
10.	Department of Chemistry	Labs and Classrooms	14840		Yes	Yes	Yes	Yes	N/a	N/a	Yes	Yes, not for differently abled
11.	DSW	Room	10 X 10		No	Yes	Yes	N/a	N/a	N/a	N/a	N/a
12.	Swami Shradhanand Hostel	Concrete	10000		Yes	No	No	No	No	Yes	Yes	Yes
13.	Pt. Lekha Ram Hostel	Concrete	8000		Yes	No	No	No	No	Yes	Yes	Yes
14.	Pt. Guru Dutt Vidhyarthi Hostel	Concrete	8000		Yes	Yes	Yes	No	No	Yes	Yes	Yes

15.	Corporate Affairs & Outreach Cell (CAOC)	Multi Stories	1095		Yes	Yes	No	No	No	No	Yes
16.	Senate Hall (Guest House)	Guest House	9000		Yes	Yes	No	Yes	No	Yes	Yes
17.	Central Office	New Structure	8000		Yes	Yes	No	Yes	No	Yes	Yes
18.	Vice Chancellor's Office	New Structure	6000		Yes	Yes	N/A	Yes	No	Yes	Yes
II.	KGC, Haridwar										
1.	Environmental Science										No
2.	Physics										No
3.	Microbiology	New Structure	15000	Yes	Yes	Yes	Yes	Yes	No	No	Yes
4.	Chemistry										Yes
5.	Ancient Indian History Culture & Archaeology										No
III.	FET, Haridwar	Educational	7008.62		Yes	Yes	Yes	Yes	No	Yes	Yes

e. Transportation



This is one of the most important aspect which needs to be considered thoughtfully. At present our audit shows that almost 90% of the faculty members are using their own vehicles for transportation for to and fro. Similarly, a good number of students are using two wheelers for coming Vishwavidyalaya Campus Though at present there is sufficient parking facility available and at the same time their ample green area is available in campus which is working as a sink for the pollution coming out of these vehicles. However, in coming time frame if the situation remains same there are chances of ambient air getting polluted.

S. No.		Deptt. Vehicle No.	Members with Vehicles	Members using public transport (%)	Use of Bicycles?	Vehicle pooling
I.	MAIN CAMPUS					
1.	Department of Philosophy	No	6	No	YES	NO
2.	Department of Zoology & Environment Science	No	10	1	1	No
3.	Department of Sanskrit	No	All	No	Yes	No
4.	Department of Physics	Nil	10	Nil	2	Nil
5.	Faculty of Management Studies	No	50	25	Yes	No
6.	Department of Psychology	No	5	No	Yes	Yes
7.	Department of Yogic Science	No	Yes	No	1	No
8.	Department of Botany & Microbiology	No	14	Nil	3	2
9.	Department of Pharmaceutical Sciences	No	28	No	30	No
10.	Department of Chemistry	N/a	15	Nil	Nil	No
11.	DSW	N/a	N/a	N/a	N/a	N/a
12.	Swami Shradhanand Hostel	No	20	Nil	No	No
13.	Pt. Lekha Ram Hostel	No	20	Nil	No	No
14.	Pt. Guru Dutt Vidhyarthi Hostel	No	10	No	No	No
15.	Corporate Affairs & Outreach Cell (CAOC)	No	3	3	No	No
16.	Senate Hall (Guest House)	No	6	Nil	Yes	No

17.	Central Office	1	58	Nil	2	No
18.	Vice Chancellor's Office	1	10	Nil	2	No
II.	KGC, Haridwar					
1.	Environmental Science	No	4	2	1	No
2.	Physics	No	2	No	No	Yes
3.	Microbiology	No	4	1	NO	NO
4.	Chemistry	No	5	No	No	No
5.	Ancient Indian History Culture & Archaeology	No	1	Yes	No	Yes
III.	FET, Haridwar	1	74	25	No	Yes

f. Landscape/ Environment



A landscape includes the physical elements of geophysically defined landforms such as living elements of land cover including indigenous vegetation, human elements including different forms of land use, buildings and structures.

Combining both their physical origins and the cultural overlay of human presence, often created over millennia, landscapes reflect a living synthesis of people and place that is vital to local and national identity. The character of a landscape in Vishwavidyalaya helps define the self-image of the culture and heritage Vishwavidyalaya is maintaining and its people who inhabit it and a sense of place that differentiates from other in terms of vedic knowledge and modern outlook. It is the dynamic backdrop to coming generation studying here with cultural and modern outlook.

While assessing the landscape environment of Gurukula Kangri Vishwavidyalaya it is clearly seen that it is a combination of culture heritage and scientific understanding. From having archaeological museum to zoological museum. But as great things are always hidden inside the shell the same is happening with the assets of Vishwavidyalaya. There is no such advertisement of Archaeological museum of Vishwavidyalaya on or near the campus near national highway. Also main campus is having one of the oldest libraries of India with lot of Vedic literature, a heritage to be indexed and available to local and other visitors and alumni's. We highly recommend some advertisement for archaeological museum and access of library facility for outside the Vishwavidyalaya visitors to see the heritage Gurukula is preserving. The beautification and green cover of the all the campuses are found good but require

maintenance and time to time upgradation. Due to major plantation in last 3 – 4 years, the taxonomical labelling is recommended in all the campuses of Vishwavidyalaya majorly for the exotic plants which are native of this region. Also there is an inventory is recommended to be developed to have the data for overall biodiversity of Vishwavidyalaya in terms of flora and fauna.

For any kind of sustainable development, a landscape management plan is majorly required which should be implemented in the campus. While celebrating major environmental days by eco-club and other departments it is very essential that with a landscape plan all the plantation could be done for better and sustainable outlook. Another major thing which is recommended a Aerial-View Map of Vishwavidyalaya and its all campuses to show the exact beautiful architecture of the all the campuses.



S. No.		Overall Green Cover	Garden	Indigenous Trees/Plants	Exotic Plants	Overall Biodiversity	Landscape Management Plan	Natural Water Bodies
I.	MAIN CAMPUS							
1.	Department of Philosophy	400 ft.	300 ft.	Yes	N/a	Yes		
2.	Department of Zoology & Environment Science	Yes	Yes	Yes	No	Yes		
3.	Department of Sanskrit	Yes	Yes	Yes	Yes	Yes		
4.	Department of Physics	Yes	Yes	Yes	Yes	Yes		
5.	Faculty of Management Studies	Yes	Yes	Yes	No	Yes		
6.	Department of Psychology	Yes	Yes	Yes	No	No		
7.	Department of Yogic Science	No	Yes	Yes	No	Yes		
8.	Department of Botany & Microbiology	Yes	Yes	Yes	No	No		
9.	Department of Pharmaceutical Sciences	No	Yes	Yes	Yes	Yes		No
10.	Department of Chemistry	Yes	Yes	Yes	No	Yes		
11.	DSW	N/a	N/a	N/a	N/a	N/a		
12.	Swami Shradhanand Hostel	No	Yes	No	No	No		
13.	Pt. Lekha Ram Hostel	No	Yes	Yes	No	No		
14.	Pt. Guru Dutt Vidhyarthi Hostel	No	Yes	Yes	No	No		
15.	Corporate Affairs & Outreach Cell (CAOC)	No	No	No	No	No		
16.	Senate Hall (Guest House)	Yes	300	Yes	Yes	Yes		

g. Green/Environmental Agenda in Syllabus



Vishwavidyalaya is committed for environmental education and awareness to motivate the students and encourage them for environmental conservation and sustainable development and to develop the relationship between human beings and the environment and to develop capabilities/skills to improve and protect the environment. To improve this, Eco-club for the Vishwavidyalaya is developed in 2012, continuously working for the awareness and encouragement among the students understand the importance of environment and need of its conservation. Further as per the UGC, New Delhi Guidelines, all the bachelors' students of Vishwavidyalaya has to study the Environmental Studies paper for one semester. Vishwavidyalaya has Established Department of Zoology and Environmental Science with a degree of Masters in Environmental Science in 1995 to promote the Environmental studies and faculties of the department are continuously working on various aspects as their research work. Further under extension education department has designed the Diploma courses for Disaster management and Industrial health, safety and environment for the core understanding of the respective subject by the students and others who are looking forward to contribute to conservation of environment.

S. No.		Environmental Education in Syllabus	Green Research	Green Club	Animal Experiments?	Ethics Committee	Extension Related to Environment	
I.	MAIN CAMPUS							
1.	Department of Philosophy	Yes	Yes	Yes	N/a	N/a	Yes	
2.	Department of Zoology & Environment Science	Yes	Yes		No	No		No
3.	Department of Sanskrit	No	No		No	No		No
4.	Department of Physics	Yes	Yes		No	No		No
5.	Faculty of Management Studies	Yes	No		No	Yes		Yes
6.	Department of Psychology	No	No		No	No		No
7.	Department of Yogic Science	No	No		No	N/a		N/a
8.	Department of Botany & Microbiology	Yes	No		No	No		No
9.	Department of Pharmaceutical Sciences	Yes	No		Yes	Yes		Yes
10.	Department of Chemistry	Yes	No		No	No		No
11.	DSW	N/a	N/a		N/a	N/a		N/a
12.	Swami Shradhanand Hostel	N/a	N/a		N/a	N/a		N/a
13.	Pt. Lekha Ram Hostel	N/a	N/a		N/A	N/A		N/A
14.	Pt. Guru Dutt Vidhyarthi Hostel	N/a	N/a		N/A	N/A		N/A
15.	Corporate Affairs & Outreach Cell (CAOC)	N/a	N/a		N/A	N/A		N/A
16.	Senate Hall (Guest House)	N/a	N/a		N/A	N/A		N/A

17.	Central Office		N/a	N/a	N/A	N/A	
18.	Vice Chancellor's Office		N/a	N/a	N/A	N/A	
II.	KGC, Haridwar						
6.	Environmental Science			Yes	Yes	Yes	
7.	Physics			Yes			
8.	Microbiology		Yes	Yes		N/a	
9.	Chemistry			Yes			
10.	Ancient Indian History Culture & Archaeology			No			
III.	FET, Haridwar		Yes	No	N/a	N/a	

Eco-Club, Gurukula Kangri Vishwavidyalaya

We all know that we are part of the environment we live in. And the solution to many environmental problems lie in our attitude towards environment. Be it awareness to keep our surroundings clean or the realization to conserve natural resources by re-using and recycling wherever possible, they all are attitudinal. On the surface it looks simple. But changing the attitudes of 100 crore people is not going to happen overnight. The best way to attempt to bring about a change in the attitudes in the society is through student. They have no vested interests. They are impressionable. They are our future. They are the single most important influence in any family. With this realization the Ministry of Environment, Forests & Climate Change, Government of India has decided to launch the National Green Corps Programme (NGC) in all Districts of our vast country.

Environment Club is beneficial to a university for many reasons but it will never reach its full potential if only one or two members of staff and a few students are involved.

ECO club is helping to promote, monitor and operate the environment activities of the institute but the whole institute community need to be involved in some capacity and more students and staff need to be encouraged to be involved in the programmes operated and monitored by the club. The entire institute community need to fully understand the true importance and value of the club and the programmes they develop and run. All too often environment clubs in institutes are seen as a token gestureallowing a institute to say they have such a club and that the institute cares about the environment. The true importance and benefit from having such a club is lost.

The institute environment club should be seen as the driving force behind all environmental and sustainable activities at the institute. Organising, Publicizing, Promoting, Monitoring all environmental/sustainability events, activities and programmes. The students should be the driving force behind the eco club not the staff. An ECO club is very important as it establishes a focal point for all environmental/sustainability activities and programmes in the institute and creating a sustainable campus in keeping with the principals of the governments programmes.



Teachers, staff and parents need to be encouraged to become actively involved in the clubs activities. One person, one teacher cannot cover all the potential activities of the Eco Club.

It should be the responsibility of the club to devise, run and monitor institute wide activities such as the reducing, reusing and recycling programmes, energy saving schemes, promotional events. The students should report the outcome and/or findings of the programmes/activities to the staff and senior management.

It is my experience that sometimes people young and old are concerned over making a long term commitment to the club. My view is to explain that they can become involved whenever they can or for specific events, programmes and activities.

There are a number of important reasons for having a strong Environment Club.

- The club is a monitoring group for ALL of the institutes environmental/sustainability activities. (Monitoring and developing reports, planning and implementing activities; assisting staff in monitoring related programmes and holding regular meetings. This will take a great deal of the day to day pressure for running these activities off the staff of the institute.)
- It is a wonderful way for the young people to develop a sense of ownership, institute pride, adding to the community spirit.
- It gives students a real sense of responsibility for their place of learning.
- It helps students develop their personal skills such as communication (verbal and written), as they will have to write and present reports. They will have to work with a number of adults such as staff as well as people from outside organisations. Through these activities they will become more articulate, more confident, more creative and develop a sense of purpose as they are able to develop their ideas into practical activities for the club and the institute.
- It must be remembered that some of their activities may not work but this should in no way diminish from the aims and objectives of the club. If an activity does not work it should not weaken the aims and direction of the environmental aspect of the institute community. It is my experience that if everyone is patient and if the activities are well thought through then most if not all the activities will succeed.

Aims and objectives of Eco-Club

The aims and objectives envisaged under the Eco - Club programme are as under:

- To understand environment and environmental problems and environmental education opportunities for students.
- To utilize the unique position of students as conduits for awareness of the society at large.
- To facilitate student's participation in decision making in areas related to environment & development.
- To bring student into direct contact with the environmental problems being faced by the society they live in and make them think of solutions.
- To involve student in action based programmes related to environment in their surroundings.

- To bring student into direct contact with the environmental problems facing the society they live in and make them think of solutions encouraging them to orient themselves in action based programmes.



List of activities conducted by Vishwavidyalaya's Eco-club	
1.	Himalayan Day - 2015 ----- "Our Himalayas: Environment Challenges & Solutions"
2.	Energy Conservation – 2015 ----- "Electric Board to Electric Board"
3.	Water Conservation – 2015 ----- "Tap to Tap"
4.	"Eco-Zoning"
5.	Workshop ----- "Fireworks: Ill effects & Health Hazards"
6.	Independence Day – 2016 ----- "AZADI - 70" ----- Tree Plantation
7.	Workshop on International Ozone Day – 2016 ----- "Impact of Ozone Depletion on water resources, Biodiversity and Human Health"
8.	Workshop ----- "Disaster Management and Sparrow Conservation"
9.	World environment Day – 2017
10.	Workshop on International Ozone Day – 2017 ----- "Effect of Ozone on Earth's Environment & control measures"



Glimpses









Recommendations

On the basis of the present audit report, the committee has come to following conclusions/ suggestions:

- ❖ To maintain the air quality of the campus there should be awareness drive to reduce the number of vehicles being used by students/ faculty members.
- ❖ There is a high need of implementing the water harvesting system in whole of the campus.
- ❖ Though efforts are being made by Vishwavidyalaya to install solar lights however it needs to be done at larger scale so as to use the solar power in place of electricity.
- ❖ As it is evident from the audit a large number of electrical appliances like tube lights and bulbs *etc.*, all these needs to replaces by LED lights.
- ❖ Rooftop solar panels can be a viable solution for energy management.
- ❖ The campus has been able to maintain its solid waste disposal however it needs to strengthen the efforts in these directions.