Dr. V. S. KRISHNA GOVERNMENT DEGREE COLLEGE (A) VISAKHAPATNAM





GREEN AUDIT REPORT

Prepared by

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Green Audit Report

It is our privilege that a green policy implementing in the organization. Main objective of this policy is to implement and continuously monitor the activities involving plantation, waste, water, soil and energy management. This helps the organization in providing a healthy environment with in the college premises as it assists the students and also the faculty to understand the necessity of greenery which is quite helpful for a healthy environment. Also, it helps us as a learning tool in elimination of different forms of wastes. In order to implement this, annual audits have been conducted in our college to identify and manage the waste properly.

Green audit has been conducted every year and a report submitted to the IQAC. The purpose of this audit was to ensure that the practices followed in the campus are in accordance with the green policy adopted by the institution. It have tremendous impact on the health and learning ability of the students.

About the college

Resolutions:

- Increasing the number of water conservation pits in the campus.
- Organizing wide scale plantation programs.
- Observation of vehicle free day in the campus on every 3rd Saturday.
- Safe disposal of harmful chemicals from laboratories.
- Developing an environmental ethic and value systems in young people.
- Sustainable use of natural resource in the campus.
- Creating awareness among the students on medicinal plants.
- Strict usage of organic compost prepared in the college.
- Creating awareness among the students to develop organic kitchen garden at their homes.

1. Introduction:

The results and conclusions and suggestions from a thorough green audit carried out at Dr. V.S. Krishna Govt. Degree College are presented in the report that continues. The audit's goals were to evaluate the college's environmental impact and spot areas where sustainability may be improved. The audit addressed topics like journeys, disposal of trash, water use, electricity consumption, and general environmental awareness.

About the college:

Dr. V. S. Krishna Government Degree College, (then non-Autonomous) established in 1968, was inaugurated by his excellency Sri. Khandubhai K. Desai, Governor of Andhra Pradesh on 12th December 1968. The College was shifted in 1969 from the University Campus to Visakha valley school area which is 3 KMs away from the present premises. Owing to keen interest showed by District Collectors Sri C. Arjuna Rao IAS, and Sri K. V. Rao, IAS who helped in acquiring land, the college was shifted totally to its permanent premises in Maddilapalem in 1980-81.

The college identified as Nodal Centre in the year 2005. The Research and Development Cell was established in the year 2010. The college was conferred autonomous status in the year 2011 and recognized as NRC in the year 2022. The college is offering both Under Graduate and Post Graduate Courses. Dr. V. S. Krishna Government Degree College (A) is providing quality education for the urban and rural background students at an affordable cost. The college has strong technical team with expertise in Digital Teaching, Learning and Research.

The college has become a byword for academic and extra-curricular achievements. The dynamic, enlightened and supportive Managing Committee comprising of members from industry, medicine, academic and administration is constantly engaged in taking the college to newer heights of excellence. Its alumni occupy distinguished positions in almost all spheres of society – Government, Banking, Finance, Academics, Sports, Armed Forces, Business and Media. The college believes in the motto "Be the First and be with the First".

Vision, Mission

Vision

"To impart quality education coupled with moral values for better employment and better citizenship".

Mission

- 1. To achieve academic excellence through coordinated and consistent effort.
- 2. To lay emphasis on providing students with knowledge rather than information.
- 3. To empower students with employable skills along with academics.
- 4. To make students more confident and self programmed .
- 5. To plan for all round personality development through co-curricular activities.
- 6. To provide a necessary and meaningful platform to our students to exhibit their natural and innate talent through our JKC activities
- 7. To produce students with commitment, integrity coupled with entrepreneurial skills required for sustainable livelihood
- 8. The above goals of our mission are aimed to translate our vision into a reality.
- 9. To align the curriculam of our institution in line with the goals of NEP-2020

Institutional Strength

Highly qualified and experienced teaching staff

Blend of traditional and modern pedagogical methods

23 Majors

Pioneers in offering post-graduation in English ,Botany, Zoology, Bio technology ,

Organic chenmistry

Pioneer in installing solar grid in educational institution

Facilitation of research activities Automated library and administrative block

Well-equipped laboratories

Well-maintained infrastructure

Vast and well-managed sports ground and gymnasium

Clean and green campus

Eco-friendly premises

Achievements in sports and cultural activities Co-educational institution Locational advantage

Scope and objectives

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Environment Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who are the part of economic, financial, social, environmental factor. It is necessary to conduct Environment Audit in college campus because students become aware of the Environment Audit, its advantages to save the planet and they become good citizen of our country. Thus, Environment Audit becomes necessary at the institutional level.

The broad aims/Objectives of the environmental auditing system would be

- Environmental education enables individuals to improve understanding of environmental issues and empower them to, take responsible decisions.
- Improving environmental standards
- Sustainable use of natural resource in the campus.
- Financial savings through a reduction in resource use
- Curriculum enrichment through practical experience
- Development of ownership and personal and social responsibility for the College campus and its environment.
- To study the progress of planned activities aimed at continual improve.
- It is useful to review of any changes.
- Enhancement of aesthetic dimension in teaching and to foster creative thinking in students.
- Developing an environmental ethic and value systems in young people.

Table-1	Green	Audit	Working	Team :
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Sl No	Name of the Members	Designation
1	Dr. I. Vijaya Babu	Principal
2	Dr. P. Jaya	Vice principal
3	Dr. Lalitha	Academic Coordinator
4	Dr. Ravi Babu	IQAC Coordinator
5	Dr. S. Padmavathi	Member
6	Dr. P. Padmapriya	Member
7	Dr. Ch. S. Anuradha	Member

2. Need for Green Audit:

Green audits, also known as environmental audits or sustainability audits, are becoming more and more necessary in today's society for several reasons:

(a) Environmental Impact: Green audits assist in evaluating and reducing an organization's negative environmental impact. They assess variables like energy use, waste production, water use, and emissions, identifying areas that might be improved to lessen environmental harm.

(b) Regulatory Compliance: Businesses must abide by the environmental laws and standards that have been set in many nations. Green audits assist businesses in complying with regulations and avoiding fines or other legal repercussions for non-compliance.

(c) Cost Reduction: Green audits can reveal inefficiencies and wasteful behaviours within a company, opening up chances for cost savings. Businesses can apply methods to save operational costs and boost overall efficiency by analyzing energy usage, resource consumption, and waste management.

(d) Reputation and Stakeholder Expectations: Consumers and other stakeholders now demand more environmentally conscious company practices. Green audits offer organization transparency and prove its dedication to sustainability, strengthening its reputation and fostering trust among clients, staff, investors, and communities.

(e) Risk Management: Environmental hazards can have serious financial and reputational ramifications for firms, including pollution events, regulatory noncompliance, and supply chain interruptions. By evaluating environmental management systems, ensuring sufficient controls are in place, and putting preventative measures in place to deal with possible problems, green audits assist in identifying and mitigating these risks.

(f) Continuous Improvement: Green audits encourage a continuing commitment to sustainability rather than being one-time events. Organizations can see trends, set goals, and implement improvement initiatives by routinely evaluating and tracking environmental performance. This iterative process promotes a culture of sustainability and propels long-lasting transformation.

(g) Sustainable Development Goals (SDGs): An international framework for solving urgent environmental and social issues is provided by the Sustainable

Development Goals. Organizations can better align their operations with these objectives with the aid of green audits, paving the way for a more just and sustainable future. To evaluate, enhance, and confirm environmental performance, green audits are essential. They allow companies to control risks, comply with rules, cut costs, improve reputations, and support sustainable development.

3. Methodology for Green Audit:

Audits of an organization's environmental performance and practices are known as "green," "environmental," or "sustainability" audits. They entail assessing the company's influence on the environment, resource usage, waste management, and adherence to environmental legislation. Here is a procedure for carrying out a green audit:

(a) Planning:

(b) Identify audit team and resources:

(c) Develop an audit plan: Create a detailed plan outlining audit activities, timelines, responsibilities, and communication channels.

(d) Data Collection:

(e) Gather information:

(f) Conduct site visits and interviews:

(g) Review documentation:

(h) Evaluation and Analysis:

(i) Assess environmental impacts:

(j) Evaluate compliance:

(k) Identify strengths and weaknesses:

(1) Quantify results:

(m) Reporting:

(n) Prepare an audit report:

(o) Communicate results:

(p) Follow-up and Improvement:

(q) Develop an action plan:

(r) Monitor progress:

(s) Continuous improvement:

The methodology adopted to conduct the Green Audit of the Institution had the following components.

3.1. Online assessment :

The Green Audit Team carried out online discussion with the college committee and evaluated the Institution's waste management procedures, energy conservation tactics, and other aspects of its green cover.

3.2. Focus Group Discussion:

The nature club, staff, and management members participated in focus group discussions on various facets of the green audit. Identification of attitudes and awareness towards environmental issues at the institutional and local levels was the main topic of discussion.

3.3. Energy and waste management Survey:

The audit team evaluated the college's waste generation, disposal, and treatment facilities as well as its energy usage pattern with the assistance of teachers and students. A comprehensive questionnaire survey method was used to carry out the monitoring.

4. Target Areas of Green Auditing:

A process for resource management includes a green audit. The actual usefulness of green audits lies in the fact that they are conducted at predetermined intervals and that the results might show improvement or change over time, even though they are individual events. The concept of an eco-campus primarily emphasizes the effective use of energy and water, the reduction of waste output or pollution, and economic efficiency.

These indications are evaluated during the "Green Auditing of this Educational Institute" procedure. In order to reduce emissions, obtain a reliable and affordable energy supply, promote personal responsibility, encourage and improve energy conservation, reduce the institute's energy and water use, reduce waste going to landfills, and incorporate environmental considerations into all contracts and services deemed to have significant environmental impacts, Eco-campus focuses on these goals. Water, energy, trash, and green campus are the focus topics for this green audit.

4.1. Energy Consumption:

4.1.1. Lighting:

The audit showed that many of the college's lighting fixtures were ineffective and outdated. It is advised to use natural light whenever possible, add occupancy sensors, and swap out conventional light bulbs for energy-efficient LED ones.

4.1.2. Heating, Ventilation, and Air Conditioning (HVAC):

The HVAC systems were discovered to be working less efficiently than necessary. Energy usage can be considerably decreased by switching to energyefficient HVAC equipment, using programmable thermostats, and performing routine maintenance.

4.1.3. Energy Awareness:

The college should promote energy conservation practices among employees and students. Campaigns, educational activities, and financial incentives for energysaving projects can all help achieve this.

Table-2	usage	of	electrical	ap	pliances

Electrical	Number	Power	Usage time
device/items		(watt)	(hr/day)
Normal Tubelight	50	3000	10:00 am to
			5:00 pm
LED Tubelight	375	15000	Do
Normal Bulb	0	0	Do
LED Bulb	40	1000	Do
Ceiling Fan	285	17100	Do



Whenever the Oridinary bulbs are used to the fullest and stopped working they have been replaced with new LED Bulbs. As a direct consequence, we obtain sufficient illumination with low-wattage LED tubes. As a result of this, we conserve power.

LED Bulbs- save energy Performing routine maintenance on electrical fans. The accumulation of dust and debris can hinder the fan's performance. Regular cleaning of the grilles, blades, and motor housing is necessary to maintain optimal operation, ensure smooth airflow & save energy

4.2. Waste Management:

4.2.1. Recycling:

There is proper mechanism of segregation of waste collected from the college campus. Plastic and other non-degradable waste is separated and handed it over to the recycling units (IYFS- India Youth For Society). Paper waste collected from the college is handed over to the ITC Indian Trading Corporation for recycling.

4.2.2. Composting: The institution has a proper composting mechanism of collecting the fallen leaf litter to convert into compost. Composting can help drastically reduce the quantity of garbage dumped in landfills while also producing beneficial compost for campus landscaping and gardening.

Table-3 Different types of waste generated in the college and their disposal

Types of waste	Particulars	Disposal method
e-Waste	Computers, electrical and electronic parts	Store these in a separate tank, and we can start selling them directly after a certain amount of time.
Plastic waste	Pen, Refill, Plastic water bottles and other plastic containers, wrappers etc	Plastic pens and bottles and other non- degradable waste is separated and handed it over to the recycling units (IYFS- India Youth For Society).
Solid wastes	Paper waste	Paper waste handed overed to recycling units.
Chemical wastes	Laboratory waste	Water should be used to neutralise. When dealing with hazardous garbage, adhere strictly to all safety regulations.
Wastewater	Washing water taps were arranged near the botanical garden and water is channelized to water the plants in the garden.	
Sanitary Napkin	-	Napkin Incinerators are arranger for proper disposal by burning the napkins.

Table-4 Water management in the campus

Water Management	Frequency	Responsible Party
Tasks		
Routine examination of	Monthly	Internal Green Audit
water supplies		Working Team
Testing for drinking water	Half-yearly	Do
quality		
Awareness of water	Half-yearly	Green Climate Team &
conservation		various department
Infrastructure for water	As needed	Internal Green Audit
distribution that needs		Working Team
upkeep and repair		
Reporting and analysis of	Annually	Internal Green Audit
water use		Working Team
Learn what causes	As needed	Internal Green Audit
excessive water		Working Team
consumption.		

Table-5 data detailing the subject at hand

Sl No	Parameters	Response
1	Source of water	Municipality, Underground, Pond (1500
		sqft) & Rain Harvesting Water
		Note: The ground's water serves as a
		drinking water supply for around 4,500
		people, including students and staff
		members.
2	Source of Drinking Water	Municipal water
3	Any treatment for drinking	2 RO plants are installed for the treatment
	water	of drinking water
4	What is the total number of	02 numbers
	motors that are used?	
5	What is the total number of	9 numbers@ 1000 liters each
	water tanks? Capacity of	
	tank	
6	Tap water	
	Quantity of water pumped	18000 liters/per day
	every day	
7	Do you waste water, and if	No
	so, why?	
8	How much water is	600 liters/per day. Remaining water of RO
	required for gardening	plants is channelised and Hand Wash water
	purposes?	turned to botanical garden.
9	How many water coolers	nil
	are there in total?	
10	Do you have access to	Yes
	rainwater harvesting?	
11	The number of harvesting	06 number,
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	units	
12	Any leaky taps	None
13	Daily amount of water that	Not applicable
	is lost.	
14	Is there any kind of plan for	Raise public awareness regarding the
	the management of water?	importance of water conservation, the
		prevention of pollution, and the
		implementation of sustainable water
		management practices.
15	Have any methods for	Rainwater Harvesting
	conserving water been	
	implemented?	

4.4. Transportation:

4.4.1. Public Transport: The college's carbon footprint can be significantly reduced by encouraging employees and students to use public transport. Sustainable transport solutions can be promoted by offering cheap bus passes, encouraging carpooling, and supporting bicycle infrastructure.

4.5. Overall Environmental Awareness:

4.5.1. Curriculum Integration: The institution can integrate environmental awareness and sustainability into its curriculum across various subject areas. This strategy will guarantee that students receive instruction and training in environmental stewardship, encouraging sustainable thinking.

able-6 Environmental	awareness programs	
Environmental	Parameters	Program
awareness across		time
different subjects		
Foundational Course	Environment Education is compulsory	3 rd
	paper is taught to all students in the	semester
	college	
Language Arts	Discuss texts from literature that are in	Whole
	some way connected to topics concerning	year
	the environment, such as conservation or	
	environmental advocacy. Through various	
	awareness programs, they understand the	
	environmental laws and regulations that	
	apply on the local, national, and	
	international levels.	
Pure Science	Conduct Community Service Projects on	
	environmental issues, such as assessing	Half-
	water quality, soil analysis, power	yearly/
	consumption or recycling and assigning	each
	environmentally friendly projects.	program
Bio-Science	Study subjects include ecosystems,	Whole
	biodiversity, and the inter connectedness	year
	of all living things.	
Physical Education	Encourage students to develop an	Whole
	appreciation for the natural world by	year
	having them participate in outdoor sports	
	and activities.	
NSS	To enhance the amount of green cover and	Whole
	fight deforestation, organizing tree-	year
	planting events in local communities and	
	educational institutions is important.	
	Regular clean and green programmes are	

Plantation Programmes











4.5.2. Student Engagement: A culture of sustainability can be promoted among students by supporting student-led projects, creating environmental groups, and holding awareness events and workshops.







Students preparing models to exhibit in workshop



Indoor plants propagating by students



Ink to Eco Program- Collection of unused plastic pens from the campus and handing over for recycling

5. Green practices followed in the Laboratories

5.1 Green practices are adapted in all laboratories where ever is possible.

Star rated appliances and equipment being purchased to minimize the electricity consumption.

The toxic products are neutralized with suitable reagents prior to disposal.
For example the toxic phenyl isocyanide produced in the carbyl amine test is hydrolyzed with hydrochloric acid to form non toxic formamide.

➤ Conventional procedures are replaced with green procedures to avoid hazardous chemicals. For example, the conventional acetylation of aniline uses harsh chemicals like acetic anhydride and dichloromethane, which are replaced with benign chemical reagents like acetic acid and zinc dust.

Inorganic salt mixtures is being tested in semi microanalysis which uses only little amount of reagents and solvents which can minimize the chemical usage during the experimentation which may prevent pollution.

➢ In order to conserve energy, one student from every batch is kept in charge to check whether all electrical appliances switched off after the use.

Power down computers after working hours. If computers are not actively in use then powering down of systems is made a practice.

> To reduce the overall consumption of plastic we are using glassware where possible

▶ It is being strictly observed to turn off the taps properly after their usage.

➢ Water baths are kept covered at all the times while maintaining the desired temperatures to minimize the energy consumption.

5.2 Laboratory practices

Much water is being used in laboratories of chemistry, Botany, microbiology and biotechnology. In the chemistry lab, lot of water will be wasted if we have not taken controlling measures. Generally, for cleaning glass ware large volumes of water is used. In biotechnology, microbiology and botany laboratories large quantities of water are being used in refilling autoclaves and glass ware cleaning. In our college the water released from these activities is collected in the plastic buckets and used for watering the plants. The laboratory waste does not contain hazardous chemicals they usually contain chlorides, nitrates and sulphates of ammonium, magnesium copper,

potassium and other salts. These are not harmful and provide essential nutrients to the plant grow

6. Green Campus:

6.1. Bio Diversity:

The following are some actions to take into account when setting up a plantation programme at our college:

Maintenance diversified gardens

Department of botany and Haritha Krishna Eco club taking utmost care in maintaining the botanical garden with diversified themes such as Ornamental Garden, Vegetable Garden, Fruit Garden, Rock Garden, Butterfly Garden, Cosmetic Garden, Scented Garden, Vertical Garden, Terrace Garden, seasonal garden and Herbal gardens with plants specified for Ayurveda and Sidda.

Practice

There is increasing concern over the biodiversity loss due to human activities. The institution takes steps in promoting biodiversity. Regular plantations most importantly the plants species which attract butterflies and keeping away from chemical-based fertilizers and pesticides.

6.2. Faunal Diversity:

Studying faunal diversity can increase awareness about environmental challenges and conservation's significance. Colleges that are home to a wide variety of animal species may be more likely to adopt environmentally friendly policies and methods of operation to safeguard the campus environment and the people who live there.

Butterfly:

Butterflies can be divided into 6 families -

Conservation and documentation of college biodiversity

The department of Zoology made significant contribution by documenting the butterfly species in the college campus.

Outcome:

It was found that new butterfly species added to the document. Plant diversity also increased to a great extent. Students also got aware of the importance of preserving endemic species.



Floral diversity of the campus

The following plant species are found in the college campus:

Table-7 List of Floral groups of the campus

Sl	Scientific name	Common	Family
		name	
1	Ficus elastica Roxb. ex Hornem.	Rubber tree.	Moraceae
2	Delonix regia	Gulmohor	Fabaceae
	(Boj. ex Hook.) Raf.		
3	Peltophorum pterocarpum	Radhachura	Fabaceae
	(DC.) K.Heyne		
4	Casuarina equisetifolia L.	Jhau	Casuarinaceae
5	Lagerstroemia speciosa	Jarul	Lythraceae
	(L.) Pers.		
6	Samanea saman	Shirish	Fabaceae
	(Jacq.) Merr.		
7	Swietenia mahagoni	Mehagoni	Meliaceae
	(L.) Jacq.		
8	Bauhinia purpurea L.	Rakta Kanchan	Fabaceae
9	Alstonia scholaris L.R.Br.	Chhatim	Apocynaceae
10	Polyalthia lingifolia	Debdaru	Annonaceae
	(Sonn.) Thwaites		
11	Tectona grandis L.f.	Segun	Verbanaceae
12	Areca catechu L.	Supari	Arecaceae
13	Terminalia arjuna (Roxb)Wight& Arn	Arjun	Combretaceae
14	Acacia auriculiformis	Sonajhuri	Fabaceae
	A.Cunn.ex.Benth		
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15	Dalbergia sisoo Roxb.	Shisoo	Fabaceae		
16	Ficus religiosa L.	Ashwattha	Moraceae		
17	Psidium guajava L.	Peyara	Myrtaceae		
18	Mangifera indica L.	Aam	Anacardiaceae		
19	Syzygium cumini (L.) Skeels	Jam	Myrtaceae		
20	Mimusops elengi L.	Bakul	Sapotaceae		
21	Neolamarckia cadamba (Roxb.)Bosser	Kadam	Rubiaceae		
22	Bambusa ventricosa Mc. Clure	Ghati bansh	Poaceae		
23	Syzygium samarangense	Jamrul	Myrtaceae		
	(Blume) Merr. & L.M.Perry[
24	Cocos nucifera	Narkel	Arecaceae		
25	Carissa carandas L.	Karamcha	Apocynaceae		
26	Citrus limetta Risso	Lebu	Rutaceae		
27	Ziziphus mauritiana Lam.	Kul	Rhamnaceae		
28	Tecoma stans (L.) Juss. ex Kunth	Chandra prava	Bignoniaceae		
29	Nerium oleander L.	Karabi	Apocynaceae		
30	Uraria picta (Jacq.) Desv. ex DC.	Prishniparni	Fabaceae		
31	Pterocarpus santalinus Linn	Rakta Chandan	Fabaceae		
32	Terminalia chebula Retz.	Haritaki	Combretaceae		
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33	Hibiscus rosa-sinensis	Joba	Malvaceae
34	Thuja occidentalis L	Jhau	Cupressaceae
35	Roystonea regia	Palm	Arecaceae
36	Euphorbia milii Des Moul.	Kata mukut	Euphorbiaceae

STUDENT SWITCH-OFF CAMPAIGN

Practice

Student switch off campaign started by assembling all the Class Representatives to learn the responsible behaviour motivate them to switch off the fans and lights when they are not needed and switch off computers and devices when they are not in use. Switch off stickers were placed near the switch boards.

7. Conclusion:

The Dr. V.S. Krishna Govt. Degree College's green audit identifies some areas that should be improved to advance sustainability initiatives on campus. Reduced energy use, better waste management, optimized water use, sustainable transportation options, and raised environmental awareness can all result from implementing the suggested solutions. Dr. V.S. Krishna Govt. Degree College can set an example of environmental stewardship for its students and contribute to a cleaner future by implementing these improvements.

WATER AUDIT REPORT

Water Audit Team

The study team constituted of the following

S No	Name & Designation
1	Dr K. Srinivas, ISO lead
	Auditor, Lecturer in
	Commerce,
	Dr VSK GDC
2	Dr . K. Srinivas Prasad,
	Member
	Department of
	Information Sciences
	Dr VSK GDC
3	Dr Ch. Lalitha
	HOD
	Department of Microbiology,
	Dr VSK, GDC
4	Dr Prakash Narayan Reddy
	Member, Department of
	Microbiology

1.5 About Water Auditing

Water audits can be a highly valuable tool for institute in a wide range of ways to improve their energy, environment and economic performance. while reducing wastages and operating costs. Water audits provide a basis for calculating the economic benefits of water conservation projects by establishing the current rates of water use and their associated cost.

1.6 Objectives of Water audit

The general objective of water audit is to prepare a baseline report on water conservation measures to mitigate consumption, improve quality and sustainable practices. The specific objectives are: To monitor the water consumption and water conservation practices. To assess the quantity of water, usage, quantity of waste water generation and their reduction within the college.

1.7 Target Areas of Water audit

This indicator addresses water sources, water consumption, irrigation, storm water, appliances and fixtures aquifer depletion and water contamination are taking place at

unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.

1.8 Methodology followed for conducting water audit

Step 1: Walk through survey Understanding of existing water sourcing, storage and distribution facility. Assessing the water demand and water consumption areas/processes. Preparation of detailed water circuit diagram.

Step 2: Secondary Data Collection Analyse historic water use and wastewater generation Field measurements for estimating current water use Metered & unmetered supplies. Understanding of "base" flow and usage trend at site Past water bills Wastewater treatment scheme & costs etc.

Step 3: Site Water Audit Planning (based on site operations and practices) Preparation of water flow diagram to quantify water use at various locations Wastewater flow measurement and sampling plan

Step 4: Conduction of Detailed Water Audit & Measurements Conduction of field measurements to quantify water/wastewater streams Power measurement of pumps/motors Preparation of water balance diagram Establishing water consumption pattern Detection of potential leaks & water losses in the system Assessment of productive and unproductive usage of water Determine key opportunities for water consumption reduction, reuse & recycle.

Step 5: Preparation of Water Audit Report Documentation of collected & analysed water balancing and measurement details Projects and procedures to maximize water savings and minimize water losses. Opportunities for water conservation based on reduce/ recycle/ reuse and recharge options

CHAPTER- 2 WATER CONSUMPTION AND WASTE WATER SOURCES

2.1 Details of Source of Fresh Water and Use Areas:

The main source of freshwater is Borewell and Cantonment Board Connection for the college. The freshwater is mainly used for drinking, housekeeping, gardening, domestic activity and new construction project. Details of the well and pumps are given in

table2.1 Table:2.1 Details of Fresh water sources and Supply pumps

Sno	Water source	location	Quantity
1	municipal	college premises and canteen	2
2	borewell	college premises	2

2.2 Water Accounting & Metering system:

It was observed that there is requirement of water flow meters on water sources to quantify water consumption in the college.

2.3 Water Storge Capacity in College Campus: - Table 2.2 Water Storage Capacity in college campus

sno	area	capacity	no	Tank types
1	College premises	500 lt (each)	10	Over head tank
2	College premises	1000 lt (each)	5	Over head tank
3	College premises	1500	2	Over head tan
4	College premises	10000 lts	1	underground
		Total storage capacity	18000 lts	

Observation & recommendation:

There is requirement of water flow meters in distribution line to quantify water consumption in departments. It is also observed that water overflow from overhead water tanks. It can avoid by installation of water level sensor.

Water use areas and taps in College Campus: -

Water is preliminary used for drinking, washing, Toilet, gardening and Domestic activity. Audit team visited various departments and buildings to determine appliances. The details of washroom, toilet and taps are given in table 2.3

Sno	Location of Taps	Fresh water taps	RO water taps
1	Ground floor- drinking for	12	6
	students		
2	Ground floor- Laboratories and	40	0
	Departments		
3	Ground floor- washrooms	30	0
4	First floor-washrooms	20	0
	First floor-Laboratories and	10	0
	Departments		
5	Second floor-washrooms	15	0
	Second floor-Laboratories and	30	0
	Departments		
	Total no of taps	157	6

2.6 Water test parameter in College Table 2.4 Water test parameter in college water

S. NO	PARAMETERS	UNITS	RESULTS	LIMITS	
		Physical Parameter			
1	pH	5	7.5	6.00 - 8.50	
2	Conductivity	µs/an	150	<50	
3	Color	Hazen	0.1	<1	
4	Turbidity	NTU	0.05	<10	
5	Total Dissolved Solids	mg/l	75.0	<20	
		Chemical Paramete rs			
6	Dissolved Oxygen	mgA	6.6	Not Specified	
7	Total Alkalinity as CaCO3	mg/l	92. 0	<50 0	
8	Total Hardness as CaCO3	mg/l	15 0.0	<40 0	
9	Phosphates	mg/	BDL	Not Specified	
1	Residual Chlorine	mgA	0.05	<0.2	
1	Iron as Fe	mg/l	0.0	<3.0	
1 2	Fluoride as F	mg/l	0.3	<2.0	
1 3	Nitrates as NO3	mg/l	1.0	<45	
1 4	Ammonia as NH ₃	mg/l	0.3	Not Specified	
15	Chloride	mg/l	50.0	<12 00	
		Microbial Parameters			
1	Es cherichia coli	CFU/ml	Absent	Should be Absent	
2	Total Coli forms	C FU/ml	Absent	Should be Absent	

Observation: - Total 02 No of water sample are tested. All parameter in Permissible range and water quality are good. Both reports are attached in Annexure -01

2.7 Fresh Water uses for Gardening:

The one of major contribution from fresh water consumption is watering for plants and garden in college campus. irrigation tools to provide different amounts of water depending on the water requirements of different plants. The drip speed can be set as for indoor and outdoor plants. 2.8 Waste Water Generation sources: -

At present waste water generated from various departments, and like washrooms, handwash and washing and RO rejected etc is discharge into drain line.it should be collect is separate tank and treat in proposed STP and ETP plants. After that treated water reuse activity like gardening, toilet and wash room etc.

Rain water Harvesting systems

The rainwater harvesting is a technique to capture the rainwater when it precipitates, store that water for direct use or charge the groundwater and use it later.

There are typically four components in a rainwater harvesting system:

Roof Catchment.

Collection.

Transport.

Infiltration or storage tank and use.

If rainwater is not harvested and channelized its runoffs quickly and flow out through stormwater drains. For storm-water management the recharge pits, percolation pits and porous trenches are constructed to allow storm water to infiltrate inside the soil. 3.0 Rainwater Harvesting System of the College

The college has total build-up area is about ()m2 . The average annual rainfall

()mm and runoff coefficient 0.88 are considered for commercial building. Accordingly, above figures and consideration, estimated rainwater harvesting potential for the college is about 7940.00 m3 /year The following Mathematical Equation is used for the calculation.

RWH Potential = Rainfall (m) x Area of catchment (m2) x Runoff coefficient

SOAK PITS









WATER TANKS ON THE TERRACE





RECOMMENDATIONS

Following are some of the key recommendations for improving campus environment:

1. A frequent visit should be conducted to ensure that the generated waste is measured, monitored and recorded regularly and information should be made available to administration.

2. Implement water-saving devices, promote conservation, analyze wastewater, install on-site treatment and grey water recycling, upgrade infrastructure, monitor quality, ensure regulatory compliance, and involve the community.

3. College should start drip irrigation to save water in campus

CONCLUSION

This audit involves considerable team discussions and meetings with key staff members on a variety of environmental-related topics. The Haritha Krishna Eco-Club of College promotes conservation of resources. Overall 60% of College campus is for landscaping and 50% is green cover. The College makes a significant effort to act in an environmentally responsible manner and takes into account the environmental effects of the majority of its activities. The recommendations in this report suggests some more ways in which the College can work to improve its practices and develop into a more sustainable institution, despite the fact that it performs rather well overall. It's important to begin a few things, such drip irrigation.

References

- ♦ The Environment [Protection] Act 1986 (Amended 1991) & Rules-1986 (Amended 2010) □
- ♦ The Petroleum Act: 1934 The Petroleum Rules: 2002
- ♦ The Central Motor Vehicle Act: 1988 (Amended 2011) and The Central Motor
 Vehicle □ Rules:1989 (Amended in 2005) □
- ♦ Energy Conservation Act 2010. \square

- ♦ The Water [Prevention & Control Of Pollution] Act 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules 1975 □
- ♦ The Air [Prevention & Control Of Pollution] Act 1981 (Amended 1987)
- ♦ The Air (Prevention & Control of Pollution) Rules 1982 \Box
- ♦ The Gas Cylinders Rules 2016 (Replaces the Gas Cylinder Rules 1981 \Box
- ♦ E-waste management rules 2016 □
- ♦ Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended 2006) □
- ♦ The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016) □
- ♦ The Noise Pollution Regulation & Control rules, 2000 (Amended 2010) □



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