

WATER AUDIT – 2020



CHRIST COLLEGE, IRINJALAKUDA (AUTONOMOUS) THRISSUR, KERALA

EXECUTED BY



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PREFACE

Water is life for all animated animal which live on the earth. As we know the rapid growth of humilation and industrialisation, there is scarce of water on the earth. There is a need for water conservation, not only to restore the fast deteriorating eco-system of the country but also to meet the inevitable emergency of shortage even for drinking and domestic water in near future. An evaluation is needed to understand its position as an environment friendly, talent nurturing educational institution. This Water Audit was done with the aim to conduct study on water sources and water usage and different water conservation methods adopted in college. The college vision is *“mould an enlightened generation by developing the potential of individuals through quality higher education and moral value inculcation”*. The college is set an example in the area of water conservation for the students for gaining practical knowledge for the same.

This report is compiled by the BEE certified energy auditor along with the project engineers who are experienced in the field of energy and water conservation. The student volunteers made a mammoth contribution with data collection and preparing an initial skeleton for the report.

ACKNOWLEDGEMENTS

We express our sincere gratitude to the management of M/s Christ College, Irinjalakuda (Autonomous) for giving us an opportunity to carry out the project of Water Audit. We are extremely thankful to all the staffs for their support in carrying out the studies and for input data, and measurements related to the project of Water audit.

We also congratulate our Water audit team members for successfully completing the assignment in time and making their best efforts to add value.

WATER AUDIT TEAM

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Registered Energy Auditor of Bureau of Energy Efficiency (BEE – Govt. of India)
Accredited Energy Auditor No – EA 7597
- 2. Mr. Ashok KMP**
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- 3. Mr. Hari Krishnan** Project Engineer



Yours faithfully

Managing Director
Athul Energy Consultants Pvt Ltd



WATER AUDIT SUMMARY

- ❖ Christ College Irinjalakuda (Autonomous) has taken considerable effort for maintaining a Water sustainable campus.
- ❖ Varieties of methods are adopted in the college for improving ground water level. Contoures and pits are provided in amny areas to percolate the water to earth and thus increase the ground water level.
- ❖ The leafs and other tree wates are used to make use in many areas to reduce erosion if soil due to the direct hit of rain water to the earth .The residence time increment for the rain water increases its percolation efficiency to earth.
- ❖ Well placed rainwater harvesting systems are there for raising the ground water level.

Suggestions for improvement

- ❖ Display boards are to be placed on the rain water collection tanks
- ❖ Installtion of water meters for different buildings to identify the water consumption pattern of different buildings.

GENERAL DETAILS

The general details of Christ College Irinjalakuda are given below in table.

Sl. No	Particulars	Details
1	Name of the College	Christ College (Autonomous)
2	Address	Christ Nagar, Irinjalakuda
		Thrissur -680125
3	Contact Person	Principal
4	Contact Phone number&E mail	0480-2825258
		office@christcollegeijk.edu.in
5	Web site	www.christcollegeijk.edu.in
6	Type of Building	Educational Institution
7	Annual Working Days	210
8	No: of Shifts	Day Shift (One) (9AM -4PM)
9	No: of students enrolled	4514
10	No: of teaching staff	210
11	No: of non-teaching staff	46
12	No: of departments	27
13	No : UG courses	28
14	No: of PG courses	18
15	Total campus area	49 Acre
16	Total Built Up area	37190M ²
17	No: of hostel students	Boys 415
		Ladies 203
18	No: of plants in college	2277
19	No: of various species	244
20	Carbon Sequestration (ton) per annum	119
21	Grounds and stadiums	Volleyball court -3No: and Basketball court-4No: Handball court -2 No: Hockey Field and, Netball, Tennis, Kho-Kho courts -1 No: each, Athletic or cricket stadium -1 No: Football field -1No: and Indoor stadium under construction.

TABLE 1: GENERAL DETAILS

ABOUT CHRIST COLLEGE, IRINJALAKUDA (AUTONOMOUS)

Christ College was started in 1956, by the Devamatha Province of the Carmelites of Mary Immaculate (CMI), an indigenous religious congregation founded in 1831 by Saint Chavara Kuriakose Elias, a religious priest and versatile genius, who envisioned education as a tool for liberation and development. Founded as per the provisions of the Indian Constitution, part III, Article 30(1) and administered by Christ College Educational Society, (Regd. No. 137/75), this college is a minority institution, affiliated to Calicut University and re-accredited by NAAC with highest grade 'A'. Christ College is dedicated to Jesus Christ, and has as its motto "**Jeevitha Prabha**", which means "**Light of Life**". Following recommendation from state government, the college was conferred the "**Autonomous status**" by University Grants Commission (UGC) in 2015, the Diamond Jubilee year of the college. Christ College is part of a century-old tradition of CMI education that is at its heart, Christian and specifically catholic. It offers an ideal vision of education that is aware of and responsive to the challenges of the nation's present situation.

Vision

Moulding an enlightened generation by developing the potential of individuals through quality higher education and moral value inculcation.

Mission

To impart quality education, imbued with Indian ethos and enriched with universal values. To mould our youth as intellectually competent, psychologically integrated and morally upright social beings.

To train them as responsible citizens of our nation who champion the cause of justice, love, truth and peace.

To emancipate them from the clutches of "Adharma" and "Ahamkara" to true freedom and fraternity. The management believes that the secret of success of our College is a community of teachers who are committed to their vocation by being professionally competent, spiritually mature, humane in dealings, and ever open to new horizons of knowledge



FIGURE 1: SIDE & FRONT VIEW OF THE COLLEGE



WATER AUDIT

Water auditing is a systematic & scientific examination of water present in the surface of earth. Less than one per cent of the Earth's fresh water source is readily available for human use. There is a need for water conservation, not only to restore the fast deteriorating eco-system of the country but also to meet the inevitable emergency of shortage even for drinking and domestic water in near future.

- Understanding the watersources in the college
- Identifying the areas were water is consumed
- Calculating the resource consumption like the land and water.
- Assessing the waste water generation of different areas such as laboratories, canteen and toilets.
- Studying the water consumption pattern
- Identifying the good practices adpted in the college for water conservation
- Suggesting viable solutions to improvements
- Compiling the report with the above-mentioned details.

CAMPUS ENVIRONMENT

The environment in and around the college campus plays an important part in maintaining a healthy atmosphere in nurturing talents. Trees are the major source of the oxygen we breathe, and receiver of the carbon dioxide we exhale. The sustainability of an ecosystem depends on the number of plants and trees in and around the surroundings. The open space in the college is used for gardening, teak plantations and buildings are built without disturbing the sustainable nature of landscape of that area.

Ultimately the campus is maintaining natural equilibrium with openspaces, buildings, trees, birds along with human interaction.



FIGURE 2: CAMPUS VIEW

Scientific studies have proved that nature can cure any disease and this will reduce the stress among students during their studies and also increase their compassion towards nature. Ultimately the campus is maintaining natural equilibrium with trees, birds, water bodies and human beings. Gardens and landscape are an aesthetic delight and promote attentiveness of students. Persons exposed to plants have higher level of positive feelings (pleasant, calm) as opposed to negative feelings (anger, fear)

1. BUILT UP AREA

There are 23 major buildings on the campus. The purpose and the built-up area of the buildings are given below. All these buildings have sufficient ventilation and natural sun light. The master plan of Christ College has been drawn to ensure and sustain harmonious blend of human and environmental well-being. Accordingly, spaces for academic, administrative and recreational areas are delineated in harmony with the topography to ensure an eco-friendly campus.

Sl.No:	Floor	No Of Floors	Total Built Up Area(M ²)
1	New Block 1 and 2 Phase	G+6	3360.00
2	Zoology, Library, and Commerce	G+2	3185.00
3	Zoology New	G+2	550.00
4	Guest Room	G+2	486.00
5	Auditorium	G+1	1063
6	Ladies Retiring Rooms	G=1	282
7	Administrative Block	G+2	5437
8	Chavara Seminar Hall	G+2	128
9	Chemistry Block	G+2	2616
10	Chemistry Block (New)	G+2	885
11	Carpentry Shed	G	128
12	Hotel Management	G+2	259
13	Physics Workshop	G+1	82
14	Main Block	G+2	1852
15	New Main Block	G+2	3612
16	Central Block	G+2	945
17	Main Hostel	G+2	4377
18	Mess Hall	G+1	1078
19	BPE Building	G+1	2196
20	New Physical Education	G+1	1586
21	Mary Rani Ladies Hostel	G+2	2078
22	Boys Hostel Play Hall	G	185
23	Boys Hostel	G+3	820
	Grand Total		37190

TABLE 2: BUILDING AREA

WATER RESOURCES AND CONSERVATION

The requirement of water for the college, hostels and for gardening etc. are met from two wells; as near ladies' hostel from a well at the hostel boundary. . The water from wells is collected in two tanks of capacity 19 KL concrete tank and 3KL synthetic tank. . The water thus collected is supplied through gravity to other tanks located in the main building, hostels, canteen, etc.

The water from different wells is checked in an accredited laboratory from time to time to ensure its potability.

1. WATER RESOURCES

There are two wells in the college, all of these water sources are outside college premises. 10 HP motors are used for pumping water to meet the requirements of college. But during rainy season most of the college requirements are met from rain water harvesting tanks of capacity 1.25Lac KL and a few 5 and 10 KL tanks installed in the hostels and other areas of the college.

2. WATER UTILITIES

The labs have the highest tap points whereas the toilet accounts for the major consumption. The water outlet points in the college campus and hostel are listed in the following table.

Floor	Wash Basin	Toilet	Bath room attached	Tap
Physical education block				
Gr. Floor	11	7	2	1
First Floor	11	8	1	
Athletic stadium				
	2	10		4
Poly house				
				10
Football ground				
		2		4
Garden				
	1	13	21	1
Auditorium				



		8	3	17
Canteen				
Ground floor	11			3
1st floor			4	
2nd floor			3	
Research block				
Ground floor	5			
1st floor	2	1		
Zoology block				
Ground floor	2	1		4
1st floor	8	1		
Commerce block				
Ground floor	4	1		6
1st floor	1	1		
Library block				
Ground floor	5		3	
1st floor	3	5	1	
2nd floor	1	1		
History block				
Ground floor	4	4	2	9
1st floor	3	6		
2nd floor	5	4		
Ladies retirement room				
Ground floor	6	7		
1st floor	4	3		
Junior hostel				
Ground floor	6	21	2	4



1st floor	6	8	2	
Main hostel				
Ground floor	9	4	18	
1st floor	9	4	18	
2nd FLOOR	9	4	14	
Mess hall	18	10	11	11
New block	6		17	
Chemistry block				
Ground floor	3	2		62
1st floor	2			48
2nd floor	9	7	1	14
Hotel management				
Ground floor	1	1		15
1st floor	2			
Lift block				
Ground floor		4		5
1st floor	2	4		5
2nd floor		4		5
3rd floor	1	4		5
4th floor		4		5
5th floor		4		5
Main block				
Ground floor	6	4		3
1st floor	12		7	
2nd floor	8		3	
Ladies hostel new building				
1st floor	1	8	14	1st floor



2nd floor	1	8	14	2nd floor
Ladies hostel old building				
Ground floor	1	2	18	Ground floor
1st floor	1	12	30	1st floor
2nd floor	1	12	30	2nd floor
3rd floor		5	8	3rd floor
Outside		1	8	Outside
Kitchen	2		4	Kitchen
Total				

TABLE 3: WATER TAPS

3. GROUND WATER RECHARGING

Rainwater harvesting (RWH) is a technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifers (before it is lost as surface runoff). There are different methods for artificial rainwater harvesting. Ground water recharging by different means and collection of rain water for direct use by installation of rain water collection tank. Ground water recharging methods are decided by detailed study of rain fall, geological and hydrogeological mapping of the area etc. Another method of rainwater harvesting is rooftop harvesting. Rooftop harvesting consists of installation of pipes, filtration unit, by pass valve, tank pumps etc.

Christ College has taken gravity benefit of college building which is constructed in the hilly terrain step wise without affecting nature. The water collected in the top buildings such as in hostels, back side buildings are collected in the tank is fed water to all toilets of main block and security areas and for providing water for gardening and cleaning of utensils in canteen. We are not using power for pumping water for all these purposes. We are maintaining continuous water during rainy season at least for 6 months (June to November) the peak time of college classes.

There are 5 local collecting 10 kl tanks installed in buildings and its overflow is collected in big rainwater collection tank. Its overflow is percolated down to ground earth. Due to the campus nature gravity flow is used for feeding rain water to down side buildings in the campus. Administration building is located down side. Hostels are upside.



Figure 3 RAIN WATER COLLECTION TANKS

Rainwater harvesting for ground water recharge

Advantages

- Conservation of water for future use
- Biological purity of water is good
- It is environment friendly, controls soil erosion and flood and provides sufficient soil moisture even during summer months.
- It provides a natural distribution system between recharge and discharge points
- Quality improvement by infiltration through the permeable media
- Water stored underground is relatively immune to natural and man-made catastrophes

SUGGETIONS FOR WATER CONSERVATION AND GROUND WATER RECHARGING.

- Suggested to conduct a detailed study on geological and hydrogeological mapping of the area to water passing through road, gutter etc

CONCLUSION

Water Audit is the most scientific way to conserve water for the future. Water Audit is a kind of professional care which is the responsibility of each individual and institutions to give attention for the minimal water wastage through its water distribution net work. The water audit reports assist in the process for giving an insight into the college about its water resources and its water conservation methods.

The auditors observed during the campus visit and after the conversation with the staff and students of M/s Christ College Irinjalakuda that they have taken continuous and considerable effort over several years for nurturing and maintaining the various methods adopted in the college for water conservation and increase of ground water level in the premises which is well appreciated by us. There is still opportunity to attain perfection through some of the identified suggestions listed in the executive summary.

ANNEXURE - 1

CERTIFICATE



Ministry of New and Renewable Energy
Government of India



GRIHA Council



The Energy and Resources Institute

This is to certify that

Ashok K M P

of

Athul Energy Consultants Pvt Ltd, Thrissur

has qualified as

GRIHA Certified Professional

on

01st August 2018



Sanjay Seth
Chief Executive Officer
GRIHA Council

Note: This certification is valid for a period of 2 years from the date of qualification (exam).



GRIHA

http://community.grihaindia.org/blocks/verify_certificate/index.php?certnumber=fyIPq2Q5JA @GRIHA Council