GREEN AUDIT

ACADEMIC YEAR 2022-2023

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ST. MARY'S COLLEGE (AUTONOMOUS)

(Re-accredited with 'A+' Grade by NAAC)

TUTICORIN 628001

JUNE 2023

GREEN AUDIT COMMITTEE

Members

1. Dr.V.Ravisankar, Associate Professor, Dept. of Civil Engg. Thiagarajar College of Engg. MDU
2. Dr. V. Saravanan,Professor, Dept. of EEE, Thiagarajar College of Engg. MDU
3. Dr.P.S.Manoharan,Professor, Dept. of EEE,Thiagarajar College of Engg. MDU
4. Dr. B. Ashok Kumar, Assistant Professor, Dept. of EEE, Thiagarajar College of Engg. MDU

College representatives

1. Dr. B. Serena Margaret, Associate Professor, IQAC Coordinator, SMC
2. Mr. A.Antony Loyala, Laboratory Assistant
3. Mr. C.Ans Kumar, Electrical / Plumbing Worker

2.3 WATER ENVIRONMENT

Water is an important natural resource and is available naturally depending on the climate and topographic features. All organisms are dependent on water for their living. Although water is available in nature, portable water is not available freely for human consumption. There have been many practices to conserve water so that it can be readily available for human use. It has been noticed that due to unsustainable use of water resources there is contamination and depletion of the ground water and also water which is available in various reservoirs like lakes, ponds, streams etc which is becoming more alarming. Therefore, it becomes increasingly important to conserve protect and manage the water resources availability and usage so that it is sustainably used within the campus. Water auditing is conducted to evaluate the quality, availability and usage of water; the facilities available and methods adopted to revitalize and use it so that the resources are intact without leading to deterioration.

2.3.1 Water Uses and management

A total of 65,300 litres of water is pumped every day for the college to meet the daily demands of the academic and administrative Department. The daily use of the water during 2022-2023 was approx. 65, 300 litres per day.

Table 2.3 Water Users in Campus

Sl. No	Persons in section	Strength(No. of persons)	Per capita demand in litres	Daily Demand in litres
1	Dayscholar (UG and PG)	1997	15	29955
2	Hostellers	240	135	32400
3	Faculty members	160	15	2400
	Total	**2397**		**64755**

Table 2.4 Key factors about water environment

1.	Total Population	2400 (apprx)
2.	Source of Water for SMC	Municipality Open well & bore well, Rain water harvesting
3.	Storage Facility Available	6 nos of UG sumps and Overhead storage tanks are provided in every building and blocks(listed separately)
4.	No. of Borewells	4 (OPENWELL) 15 – Borewells
5.	Major Purpose of Water Usage in the study area	Drinking Washing Gardening and Flushing of Toilets

Table 2.5 Overall water consumption pattern

S.no	**Location of storage tank**		**Total capacity (l)**	**No of filling per day**	**Total water consumption per day (l) (apprx)**
1.	Chemistry (SW)		6500	3	19500
2.	Fathima hall	GW	7500	1	7500
		SW	7500	1	7500
3.	Sintex tank		1000	1	1000
4.	Chemistry sintex	GW	2000	1	2000
		RO	2000	1	2000
5.	SSC tank		1000	2	2000
6.	New building	GW	200 x 2	2	800
7.		RO	500 x 1	1	1000
8.		RO	2000 x 1	1	2000
9.	Matha tank		3000	2	6000
10	Zoology Dept	SW	1000 x 1	1	1000
11		GW	2000 x 2	1	4000
12	Sump(GW)		500	Rare	500

S.no	Location of storage tank		Total capacity (l)	No of filling per day	Total water consumption per day (l) (apprx)
13	Valanbi(SW)		500	Rare	500
14	Hostel	RO	2000	2	4000
15		GW	1000	2	2000
		SW	2000	1	2000

OVERALL CONSUMPTION PATTERN

Approximate consumption pattern for the institution per day } =65, 300 litres per day

2.3.2 Water quality

- Bore well water in different sites within the campus exhibit variability in electrical conductivity, pH, alkalinity, hardness, calcium, and magnesium, chlorides, sulphate and phosphate level.
- However, level of iron, manganese, nitrate and fluoride in bore well water are within acceptable limit.
- It is underlined that bore well water is only used for toilet purpose and rarely for irrigation.

2.3.3 Drinking Water

RO Plant for drinking purpose

SMC campus has RO plant capacity of 3 numbers of 250 LPH and 3 numbers of 500 LPH

Raw water is processes by RO membranes, for the treated drinking water, which send to all departments for drinking purposes. The RO reject from the process is sent to gardening area and for Flushing of Toilets.

2.4 RAIN WATER HARVESTING

The large amount of runoff is generated within this college premises during monsoon. As huge amount of runoff water flowed out of the premises, the role of rainwater to recharge the aquifer system was very much limited. The inadequate natural recharge and over exploitation of water due to increasing demand resulted in reduction in yield of sub surface sources. So, it had become an essential requirement to implement the Artificial Recharge Structures to resort to suitable measures for alternative source of water to get sustainable yield from the available water sources and also to improve the quality of ground water. The total extent of the premises of this college is around 15.54 acres. The roof area of the buildings comprising various departments .

Table 2.6 Rainfall catchment area details

Sl.No	**Roof type**	**Total Roof Top Area in m^2**	**Runoff coefficient**	**Annual rainfall in m**	**Runoff in m^3**
1	RCC roof	13694	0.9	0.818	10641.6
2	AC sheet.	1532.18	0.85	0.818	1065.32
3	PAVED SURFACE	9017.00	0.5	0.818	3687.953
4	UNPAVED SURFACE	38669.78	0.20	0.818	6326.37
		Total Annual Rainfall potential of the campus			**21,721.25 m^3**

The total annual rainfall potential of the study area is 21,721.25 cubic meter , out of which 11,706.920 cubic meter of water can be harvested directly from roof top area.

Based on the information collected and observations, the followings can be recommended to reduce water use and increase its efficiency

Observations

- There is no provision of water meters to measure the usage of water.
- At times there is overflowing of overhead water tanks.
- The Roof-Top rain water is mixed with storm runoff and storm water is send outside the campus without any specific usage.
- There is no provision for the storage of roof top harvested rain water.

Suggestions and Recommendation

- Water meters can be installed at major inlet points to monitor the water consumptions.
- Sensor based Automatic water level detectors are to be installed to avoid the spillage of water.
- Establish a system to collect and use the rooftop rain water separately to reduce the extraction of groundwater.
- Storm water can be stored in tanks after a small purification process with the help of a sand filter and silt tank.
- The surplus water can be sent to a ground water recharge system depending upon the conditions and situations.
- Low flow faucets can be installed for water taps in order to reduce the water consumptions.
- Dual flush systems can be installed in European Water Closet.

- Water conservation awareness activities are to be organized by involving all the stake holders especially the students, to emphasize the necessity of water conservation.
- Rainwater harvesting systems could be improved in order to recharge the ground water sources in each and every building.

2.5 WASTEWATER MANAGEMENT

Wastewater gets generated from academic areas; administrative areas, Hostels, and canteen are collected in Under Ground septic tank located at 13 places inside the premises. The treated effluent from the septic tank is sent to dispersion trench and soak pit for further removal of pollutants. The accumulated sludge from the septic tank system is periodically removed.

Observations

- At some places due to the lack of free board the top of the septic tank cover is slighted above the natural ground level which leads to the possibility of seepage of storm water into the system.

Suggestions and Recommendation

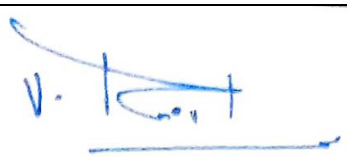
- Ensure sufficient free boards to be provided for all septic tanks.
- Explore the possibility of interlinking of septic tanks and propose a centralized sewage treatment plant for the recovery of wastewater for gardening and flushing purpose.

3. SOLID WASTE MANAGEMENT

3.1 Introduction

Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and public

Team of TCE Engineers conducted Green Audit

Sl.No	Name of the Person	Discipline	Signature
1.	Dr.V.Ravisankar,	Associate Professor, Department of Civil Engineering	
2.	Dr.V.Saravanan	Professor, Department of Electrical & Electronics Engineering	
3.	Dr.P.S.Manoharan	Professor, Department of Electrical & Electronics Engineering	
4.	Dr.B.Ashok Kumar	Associate Professor, Department of Electrical & Electronics Engineering