



"Dissemination of Education for Knowledge, Science and Culture."
- Shikshanmaharshi Dr. Bapuji Salunkhe



SHRI SWAMI VIVEKANAND SHIKSHAN SANSTHA'S VIVEKANAND COLLEGE, KOLHAPUR (EMPOWERED AUTONOMOUS)

2130, 'E' Ward, Tarabai Park,
Tal. Karveer, Dist. Kolhapur - 416 003.
Affiliated to Shivaji University, Kolhapur (M.S.)

NAAC Reaccredited : 'A' (CGPA - 3.24 in 3rd Cycle)
College with Potential Excellence by U.G.C., New Delhi
"Star College" by D.B.T. Govt. of India
ISO 9001 - 2015

Ph. : 0231-2658612 Fax : 0231-2658840 Resl.: 0231-2653962 Website :www.vivekanandcollege.ac.in E-mail :info@vivekanandcollege.org

Founder
Dr. Bapuji Salunkhe
D. Lit.

President
Hon. Chandrakant Dada Patil
Higher and Technical Education Minister, Maharashtra

Chairman
Prin. Abhaykumar Salunkhe
M.A.

Secretary
Prin. Mrs. Shubhangi Gawade
M.Sc., B.Ed.

Principal
Dr. R. R. Kumbhar
M.Sc., M.Phil., Ph.D.

7.1.4 DVV- CLARIFICATION

Deviation Details	Findings of DVV
<p>Water conservation facilities available in the Institution:</p> <p>i. Rain water harvesting</p> <p>ii. Borewell /Open well recharge</p> <p>iii. Construction of tanks and bunds</p> <p>iv. Waste water recycling</p> <p>v. Maintenance of water bodies and distribution system in the campus</p>	<p>Provide Green audit reports on water conservation by recognized bodies</p>
<p><u>HEI Response:</u></p> <p>We have provided</p> <p>i. The part of Green Audit report related to Water conservation.</p> <p>ii. Certificate from recognized body to prove our claim.</p>	



R.R.K.
Dr. R. R. Kumbhar

PRINCIPAL
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

CERTIFICATE

This is to certify that Vivekanand College, Kolhapur (Autonomous) had undergone Water Audit as a part of Green Campus Initiative in year 2022-23.

The detailed report of Water Audit is maintained in the Green Audit report of Vivekanand College Kolhapur (Autonomous) itself. No Separate report is prepared.

Date- 20-05-2024



Issued by
PY. Mandowara
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(D. CE, B.E.(Env.) L.L.B)

Principal Consultant

SkyIN Environmental Consultancy



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DVV Clarification

7.1.4

The part of Green Audit report related to Water Conservation





5.0 Water

Water is the only substance that exists naturally on Earth in all three physical states of matter solid, liquid, and gas and it is always on the move among them. Earth has oceans of liquid water and Polar Regions are covered by solid water (<http://scifun.chem.wisc.edu/>, 2017). The purpose of a water audit is to quantify the amount of water that is being produced or supplied by a water system, but that is not being delivered or billed to customers. By examining in detail the areas water is being used in a system, sources of lost water can be identified, and an action plan can be developed to control or reduce water losses (Rowley- Massachusetts, 2016).

5.1 Water Audit

Water Audit comes into picture in late 80s to overcome a drought related problem, shortage, leakages and losses. The goal of an audit is to express an opinion on the person / organization / system etc., in question, under evaluation based on work done on a test basis. Water audits provide a rational, scientific framework that categorizes all water use in your system. It is a tool to overcome drought related problem, shortage, leakage and losses (Ganorkar *et. al.*, 2013). A wastewater audit determines the water flowing through a water supply system for transport and treatment. The intention of the wastewater audit is to help align the amount you pay for wastewater services with your actual volume of discharge (<https://www.watercare.co.nz/>, 17.08.2017).

5.2 Water Consumption at VCK Campus

Ground water is main water sources in the form of two private bore wells and wells. Although the municipal water supply is available however it is used in very less quantity. The water from the well is used for the English Medium School and office which was not under the scope of audit hence the well water consumption not considered. The main sources of water source are

- Bore well back side of Sr. Building,
- Bore well Girls Hostel &
- Well near institution building
- Water supply from Municipal Corporation (Annexure-C, F & G).

The Water source, storage and usage are shown in the schematic diagram 1, 2 & 3.



1. Bore well back side of Sr. Building,

Sr. College building is having ground and three floors, first and second floor have laboratories of Chemistry, Botany, Micro biology, Physics, Zoology, etc. where in washbasins are provided with the taps, number of taps are 126. Also the washbasins are provided in staff rooms, library, offices, etc the numbers are 28. At the first floor the water fountain is installed however it was not in operation at the time of water survey. Library water mainly use for washbasins and in toilets. The toilets and urinals are available at various locations across the college like adjacent to senior college building, basement, 1st, 3rd floor, library, junior college building staff room and offices. In total there are 60 urinals and 26 toilets, the toilets are connected to cisterns of capacity of 10 liters. The water is used for purpose of flushing and face/hand washing.

The water is also used for the purpose of cleaning, mopping and washing of Sr. College building and surrounding area activity once in week. The canteen has separate water supply line from bore well which supplies water continuously to canteen. The canteen has 6 taps and basins for hand washing. The water is treated and used for drinking purpose. The canteen is operated for 8 hour's day. The water is also used for the purpose of cleaning, mopping and washing activity once in day.

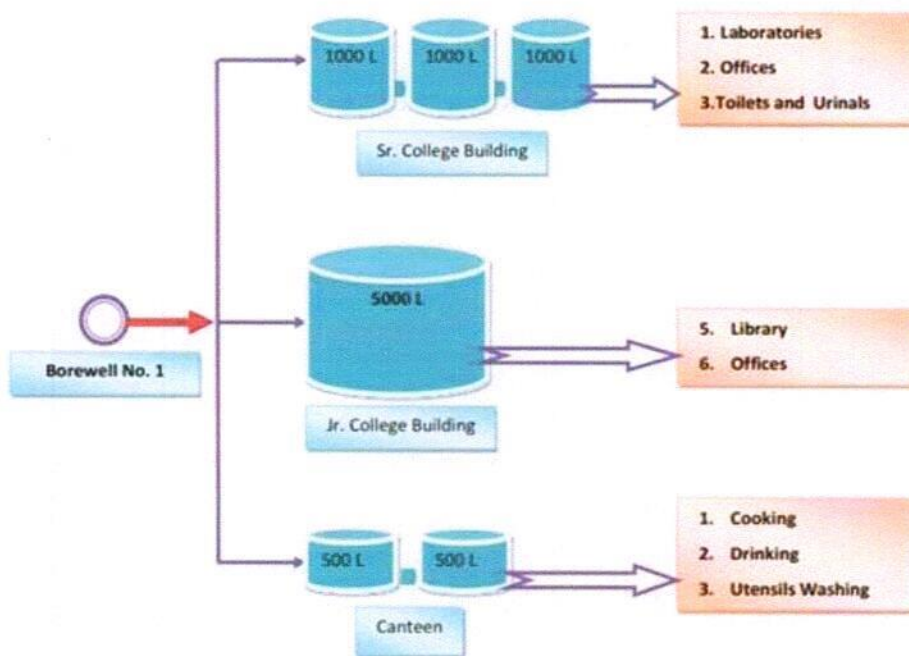


Figure No.5.1 Schematic diagram of Water Source, Storage and Usage for Bore Well

01

Two girls hostels buildings with ground and two floors accommodating 200 girl students and 5 staff. The water is stored on the terrace of the building in plastic tanks; the water is used for drinking, bathing, washing and moping, cleaning, cooking purpose.

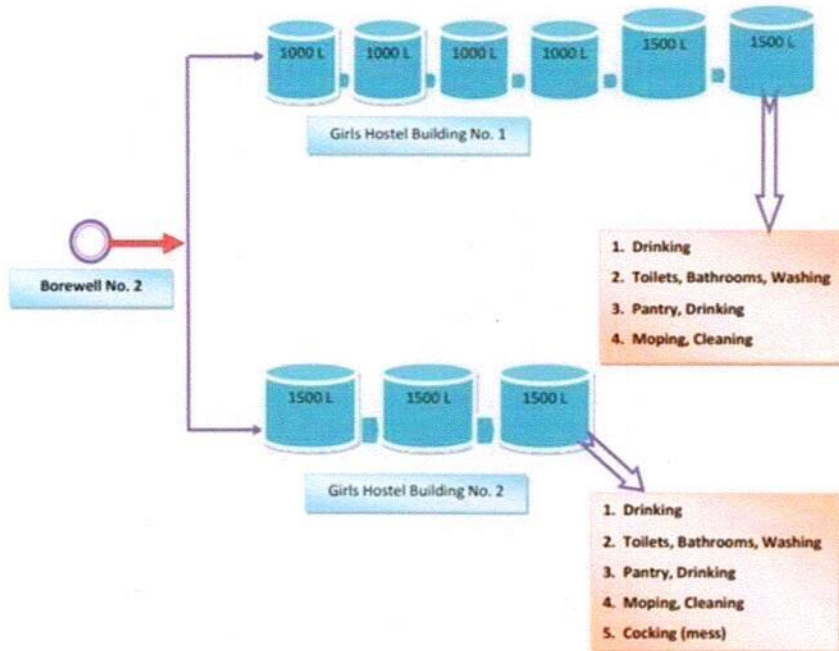


Figure No.5.2 Schematic diagram of Water Source, Storage and Usage for Bore Well

02

3. Well Near Institutions Building:

Another source of ground water this water is used for the gardening purpose. The water is extracted using the submersible pump provided.

4. Municipal Water Supply:

Municipal water is sourced from surface water and supply for 3 to 4 hours a day and stored in two plastic tanks of 500 liter each. This water is mainly used for drinking purpose through the cooler placed at the ground floor of Sr. building. The water is also used for the washing purpose. Water meter is provided on the municipal water line inside college premises however the water readings are not recorded to measure the water consumption.



Figure No.5.3 Schematic diagram of Water Source, Storage and Usage for Municipal water Supply

The strength of the college is 8385 students and 441 staff, The average working days for the college is 25 days a month and average class hours is 6 per student in a day during which the average visit to washroom is about 1.5 times.

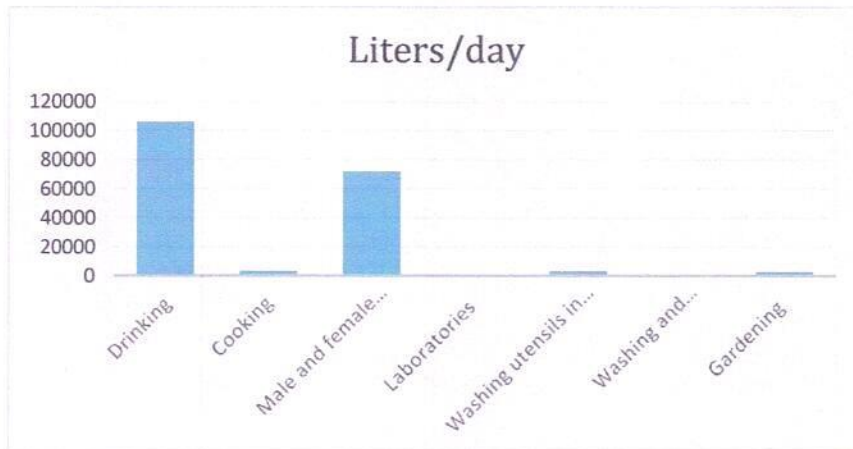
5.3 Data Comparison and Analysis

Table no. 5.1 Summary of water consumption (Except girl's hostel)

Sr. No.	Activity	Liters/day	Liters per capita per day (lpcd)	Percentage of total usage
1.	Drinking	105921	1.20	11.53
2.	Cooking	3000	0.34	3.27
3.	Male and female Toilet and urinal flushing	71701	8.12	78.09
4.	Laboratories	625	0.07	0.68
5.	Washing utensils in canteen	3000	0.34	3.27
6.	Washing and cleaning	200	0.02	0.22
7.	Gardening	2700	--	2.94
		91817	10.10	

Table no. 5.2 Summary of water consumption (Girl's hostel)

Sr. No.	Activity	Liters/day	Liters per capita per day (lpcd)	Percentage of total usage
1.	Drinking	1230	6	5.09
2.	Cooking	1230	6	5.09
3.	Bathing and basin water usage	6150	30	25.45
4.	Cloth Washing	4100	20	16.97
5.	Toilet flushing	8200	40	33.93
6.	Washing utensils in mess	3075	15	12.73
7.	Washing and cleaning	180	0.88	0.74
		24165	177.88	



Graph No. 5.1 Water Consumption Activity in VCK Campus (except girls Hostel)



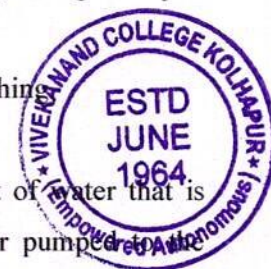
Graph No. 5.2 Water Consumption Activity in Girls Hostel.

From the table 5.1 & 5.2 based on the above data recording, monitoring and calculations the total water consumption at Vivekanand College

- 91817 liters per day and the per capita use is 10.10 lpcd considering the student strength 5000 and staff 441 per day.
- The potable water consumption in 13591 liters for drinking and cooking purpose, the per capita consumption of potable water is 1.54 lpcd.

➤ The total consumption of non-potable water for toilet, hand washing, lab use, mopping, and gardening is 78226 liters/day, the per capita consumption for non-potable usages is 8.56 lpcd.

• 78 % water is consumed only for toilet and urinal flushing



College: There is a slight variation in the average amount of water that is pumped to the overhead tank and water used. The average water pumped to overhead tanks is 91800 liters/day and the average consumption calculated is 89117 liters/day. The water used for gardening purpose having separate line from same borewell. The difference of 2683 liters could be due to certain assumptions were taken while calculating water consumption, e.g. the presence of staff and students, in addition the floor cleaning not done daily and the watering to plant sometimes twice a day.

Girls Hostel: Due to unavailability of water meters the exact quantity of water pumped to overhead tank is not possible measure, hence the basis of interaction with hostel staff the overhead tank filled twice in a day. The water pumped to the overhead tank is considered 23000 liters per day and the average water consumption calculated is 24165 liters per day.

5.4 Water losses

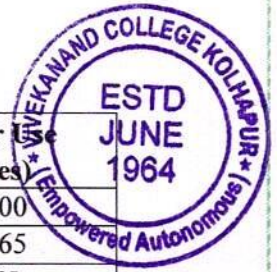
At many places it was observed that taps were leaking.

Table no. 5.3 Total Water Supply and Use at College

Sr. No.	Heads	Water Use (litres)
1.	Average daily water supply, to the overhead tanks	91800
2.	Total calculated water consumption from the water audit	89117
3.	Difference between water consumption from overhead tanks and actual water use for various purposes	2693

Table no. 5.4 Total Water Supply and Use at College

Sr. No.	Heads	Water Use (litres)
1.	Average daily water supply, to the overhead tanks	23000
2.	Total calculated water consumption from the water audit	24165
3.	Difference between water consumption from overhead tanks and actual water use for various purposes	1165



5.2 Rain Water Harvesting in VCK Campus



Figure No. 5.3 Rain Water Harvesting in VCK Campus Main Building + Library

- Annual Rainwater Endowments from Rain water Harvesting
 - Main Building 905.69 m² (Roof: Corrugated metal sheets) = 731.34 m³.
 - Main Building 905.69 m² (Roof: Concrete Slab) = 602.28 m³.
 - Library 338 m² (Roof: Solar Concrete) = 272.94 m³.

Total Annual Rainwater Endowments from Rain water Harvesting= 1606.56 m³.

The available quantity of water from the area is 1606.56 m³; part of it could be effectively harvested, by providing a recharge of wells, for recharging the subsurface shallow and deep aquifers, at the locations inside or around VCK campus.