

**POST GRADUATE GOVERNMENT COLLEGE FOR GIRLS
SECTOR – 11, CHANDIGARH**



**Water Audit Report
2023**

EXECUTIVE SUMMARY

The Post Graduate Government College for Girls, Sector-11, Chandigarh has a campus area sprawling in 35 acres and located at the foothills of the Shivalik Mountains. The College has four separate hostels for girls within its campus. There is almost 189.44 m³/day water consumption. An intensive water audit is conducted and outcomes of audit are as below:

1. The main source for potable water is Government supply and rest is tertiary water supplied through water supply grid system from Dagian village, Mohali.
2. The water supply is 24x7 with underground and roof storage tanks.
3. The building is well-maintained and a lot of efforts are made to ensure zero water loss due to leakages as a result of which, no major leakages were found mainly from the taps and water cooler.
4. The reuse of potable water in form of grey water is used in the mopping and floriculture operations.
5. There is also a provision of rain-water harvesting and recharging system installed in the campus. This indicates management consciousness about the ground-water level and contributing its own part towards the artificial recharge.
6. The sprinkler system is also installed for efficient use of water, minimizing its wastage.

Objective of Water Audit at Post Graduate Government College for Girls, Sector-11, Chandigarh

The objective of the water audit is to ensure optimum water consumption in all operations in the college campus. Another objective is to generate and maintain awareness on optimum utilization of water resources. The following are the major outputs of water audit:

1. Establishment of water balance of the facility to understand the water consumption and discharge by the plant and the quantum of water loss in the system.
2. Data analysis for the water supply system from the direct and stored water reservoir to water consuming units, storages, canteen processes, domestic use etc. including grow-water treatment, waste-water treatment and discharge.
3. Exploring possibilities and options for appropriate and suitable water conservation activities such as rain-water harvesting, ground-water recharge, recycling and reuse etc. and commendations for water conservation and management plan based on the outcomes of the observations and analysis.
4. Based on the data availability an attempt shall also be made for cost-benefit analysis on water saving.
5. Identification of additional sources of water supply.
6. Identification of major areas of water consumption.
7. Identification of leakages and water loss areas.
8. Scope of improvement of water conservation.

Water storage capacity

The water is distributed in the entire campus. There are total 90 water storage tanks other than underground main storage tank. These 90 water storage tanks are installed in different areas. The list of the tanks and the storage tank capacity is as below:

- Total Number of 5000 litres Tank: 20
- Total Number of 2000 litres Tank: 24
- Total Number of 1000 litres Tank: 43
- Total Number of 500 litres Tank: 02
- Total Number of 300 litres Tank: 01

Number of times the water tanks filled per day: 2 Times

Total Fresh Water Available: $100,000+48000+43000+1000+300 \times 2 = 3,84,600$ litres

Water Requirement in the Campus:

Total number of students: 3818 (2969 Day-scholars + 849 Hostel-students)

Number of employees: 256 (112 Teaching faculty + 144 non-teaching)

[(No. of day-scholars+employees) X 30 litres] + (No. of hostel-students X 100 litres)

$=[(2969+256) \times 30] + (849 \times 100)$ litres = 1,81,650 litres

So, total approximate water requirement in the campus: 1,81,650 litres.

Hence, the college has a storage capacity of twice the requirement of the stakeholders on the campus.

Water Consumption

The water consumption is calculated based upon two types of water: Potable and Non-potable water.

- Potable water consumption is in the following areas:
 1. Water cooler (Drinking water and R.O. Rejection)
 2. Wash-basin
 3. Canteen
- Non-potable water is used in the following areas:
 1. Washrooms
 2. Gardening
 3. FireWaterTanks

The break-up for water consumption is as below:

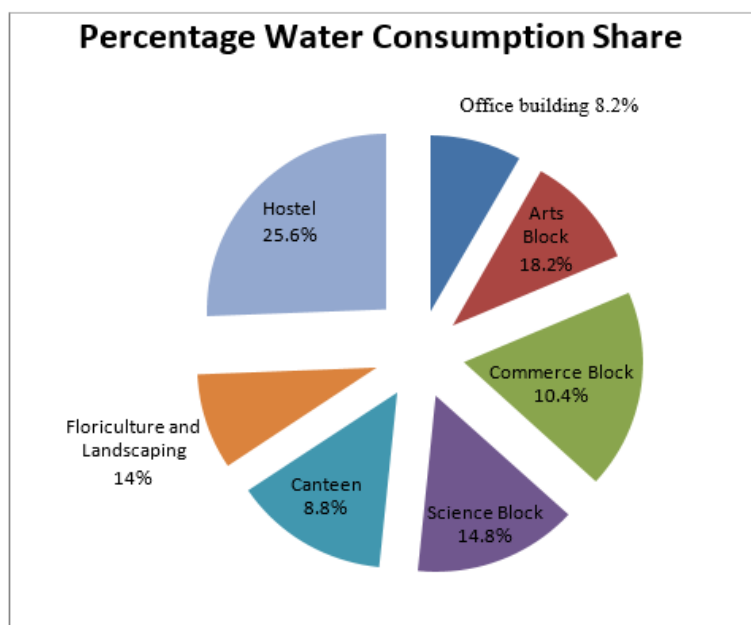


Figure1: Percentage share of water consumption

WATER CONSERVATION MEASURES

Rain-water harvesting

Rain-water harvesting is a technique used for collecting, storing and using rain water for floriculture and landscaping operations as well as recharging of the water table. Normally, when it rains, the rain water pours off the roof, down through the gutters and runs off into the yard or street. With rain-water harvesting, rain water is collected in a water storage tank or cistern and stored for later use. Rain water is a renewable, sustainable and a high quality water source. Some of the benefits of collecting and storing rain water include:

- Making use of a valuable resource that is "free of cost".
- Improving plant growth by using rain water for irrigation because stored rain water is free from pollutants as well as salts, minerals and other natural and man-made contaminants.
- Reducing water bills and demand on the community's drinking water supply by using rain water for flushing toilets, washing clothes, watering the gardens and washing cars.

Water trapped in 22 trap units from rooftop areas is collected in filtration tank. Filtration tank is further connected to the recharge well.

Rain Water harvesting per day per 100 sq. mtrs in Chandigarh: 98

Number of Rainy Days: Approx. 72 (2022-2023)

Catchment area of roof top in sq. mtrs in the PGGCG-11 campus: 2012.8 sq. mtrs

Rain water harvesting (in litres) for the season: $(98 \times 72 \times 2012.8) / 100 = 142,023.168$ litres of water.

POST GRADUATE GOVERNMENT COLLEGE FOR GIRLS, SECOR 11, CHANDIGARH
RAIN WATER HARVESTING UNIT



FILTRATION TANK
 (35 ft x 11.5 ft x 6 ft)

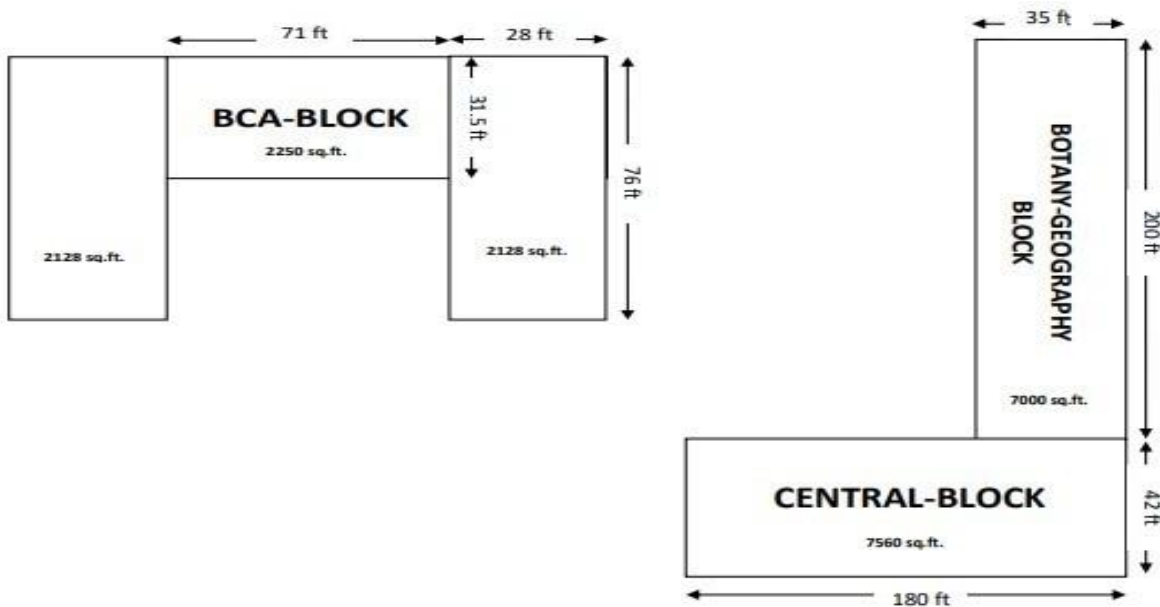


RAINWATER TRAP UNIT
 (3 ft x 3 ft x 3 ft)

Total roof top area for rain water harvesting

- Botany Geography Block: 7000 sq. ft.
- Central Block: 7560 sq. ft.
- BCA Block: 6506 sq. ft.
- TOTAL AREA: 21,066 sq. ft.**

Total rainwater trap units connected to above said rooftop area: 22



Roof-top measurements in Blocks

Tertiary water supply in the college

To conserve and to prevent the wastage of potable fresh water, the college has taken connection of tertiary water supply from sewerage treatment plant (STP) situated at Diggian village in Mohali. This treated water is used to water the lawns and all floriculture and Landscaping operations, hence meeting 100% demand of all floriculture and horticulture activities of the college campus with the help of 15 hydrants.

Grey-water

Grey water stream is defined as all waste water streams generated from office building and different blocks except for the waste water from toilets. Grey water is the amount of waste water from filters and water coolers which has an intense reuse potential for mopping, floriculture and landscape irrigation, hence reducing load on potable water. Grey water (GY) harvesting is a futuristic approach for sustainable growth which can contribute in reducing pressure on water resources and plays a fundamental role in sustainable management. The innovative resource recovery strategy utilizing onsite grey water recycling, tertiary water and rain water harvesting, meet 25% of the demand for various non-potable uses such as mopping, horticulture and floriculture crops. The GY, a dual economy process not only provides efficient irrigation but also has economic environment benefits, where it mitigates 47.7 metric tons of CO₂ annually.

Use of sprinkler irrigation system in lawns

The sprinklers are installed all over the campus in the grounds and lawns adjoining different blocks and hostels for effective use of water as well as minimizing the loss. In this method, water is sprayed in the air and allowed to fall on the ground surface. It also ensures the uniform distribution of water to the ground surface.