



### 6.5.6 SPIHER's Initiatives to Promote Conscious Water Usage on Campus

SPIHER actively promotes conscious and responsible water usage across the entire campus as part of its ongoing commitment to sustainability and environmental stewardship. Recognising water as a critical and limited natural resource, the institution has implemented a comprehensive set of awareness, operational, and behavioural initiatives to encourage efficient water use among students, faculty, staff, and campus visitors.

Water consumption for various purposes S. No.	Types of consumption	Normal range (L/capita/day)	Average
1.	Per capita domestic consumption at hostel and canteen	93-126	114
2.	Industrial and commercial demand at laboratories	124 - 255	189
3.	Public uses including fire demand, transport washes	2378-3345	2620
4.	Losses and waste as routine consumption	37-53	37
5.	Daily use (day-to-day use)	64	28

### Water consumption rate

Since several variables are influenced water consumption by various stakeholders of an organization; it is hard enough to precisely assess the water quantity demanded by the public. Water is an immense requirement of any living organism. Though it is a natural resource, we are exploiting water for various purposes in day-to-day activities. As an educational institution, water requirement for various activities may differ. Per capita Domestic Consumption in Hostels combined with Canteen ranges 52 between 90 - 125 litres. Industrial or laboratory demand for water is estimated ranges between 100 - 300 litres.

Losses as leakages and routine consumption accounts approximately 30 - 50 litres (per capita) and other uses daily usage uses accounts another 50 litres. To build awareness, the university regularly conducts campaigns, workshops, and sensitisation programs on water conservation. These sessions emphasise the importance of reducing wastage, adopting mindful usage habits, and understanding the broader impact of water scarcity. Posters, digital displays, and signage across academic blocks, hostels, laboratories, and common areas consistently remind the campus community to use water thoughtfully. Special events, such as World Water Day activities and expert talks, further strengthen awareness and community engagement.

Operationally, the university has adopted several best practices to minimise unnecessary consumption. This includes the installation of low-flow faucets, sensor-based taps, dual-flush toilets, and leak-proof plumbing systems. Regular inspections and rapid repair mechanisms are in place to prevent water loss due to leaks or faulty fixtures. Landscaping across the campus uses drought-tolerant plants and efficient drip irrigation methods to reduce water demand while maintaining a green environment.

## **Water quality**

After air, water is the second most critical element for life to exist. As a result, the scientific literature has numerous descriptions of water quality. It is the physical, chemical and biological characteristics of water, is the most frequently used definition of water quality. Water quality is a measurement of the state of water in relation to the needs of one or more biotic species and/or to any human need or purpose.

One of the most crucial aspects of water quality is pH. It is described as the hydrogen ion concentration's negative logarithm. It is an arbitrary number that expresses how acidic or basic a solution is. Actually, water's pH is a gauge of how acidic or basic it is. Both basic and acidic water have more hydrogen (H<sup>+</sup>) and hydroxyl (OH) ions than usual.

Total dissolved solids is referred to as TDS. It calculates the overall concentration of soluble salts and minerals in water. One mg/L of dissolved minerals, for instance, means that the water pitcher contains one mg/L of TDS.

The salinity of a body of water, commonly known as saline water (also see soil salinity), is the degree to which salt is present. It is often measured in grams per litre (g/L)., Water that is cloudy is referred to as turbid. It gauges how well light can travel through water. It is brought on by particulate matter suspended in water, including clay, silt, organic matter, plankton and other particles.

One of the most crucial indicators of the water quality in streams, rivers and lakes is dissolved oxygen (DO) which is regarded as one of the factors. It is an important indicator of water pollution. The water quality improves as the dissolved oxygen concentration does.

Water quality monitoring has become a global priority due to increasing pollution, climate change, and rapid urbanization. Traditional field-based sampling methods, while accurate, are time-consuming, costly, and limited in spatial coverage. Remote sensing technologies, combined with advanced deep learning models, now offer efficient, scalable, and real-time solutions for large-area water quality assessment.

This survey highlights the recent advancements in using remote sensing images—such as multispectral, hyperspectral, and satellite imagery—for predicting key water quality parameters including turbidity, chlorophyll-a, suspended particulate matter, and dissolved organic matter. Deep learning architectures like Convolutional Neural Networks (CNN), U-Net, LSTM networks, and hybrid models have shown exceptional capability in feature extraction, pattern recognition, and handling high-dimensional data.

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Chapter

## Remote sensing images for water quality monitoring based on deep learning model: A survey

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### Physico-chemical properties of various water sources

S.No.	Water source	pH	TDS (mg/L)	Salinity (mg/L)	Turbidity (NTU)	Dissolved Oxygen (mg/L)
1.	RO water	7.8	178	312	4.4	6.3
2.	Tap water	6.6	1197	314	4.8	6.7
3.	Well water	6.8	1168	313	4.4	6.3
4.	Waste water	7.9	270	333	5.1	8.5
5.	Treated water	8.1	390	537	5.1	8.4
	Mean	4.14%	356.07%	201.04%	2.66%	4.03%
	SEC ±	0.13	28.87	2.55	0.13	0.12
	CD at P = 0.05:	0.23	51.44	4.55	0.23	0.21

### Conclusion

SPIHER demonstrates a strong and consistent commitment to promoting conscious water usage on campus through a combination of awareness programmes, operational improvements, and responsible consumption practices. By closely monitoring water usage across hostels, canteens, laboratories, public facilities, and general daily activities, the institution ensures that water resources are utilised efficiently and responsibly. Regular sensitisation initiatives, campus-wide campaigns, and visible reminders cultivate a culture of mindful water use among students, faculty, staff, and visitors. At the same time, the adoption of water-saving infrastructure such as low-flow fixtures, sensor-based taps, and leak-proof systems significantly reduces avoidable wastage. Sustainable landscaping methods and continuous maintenance further strengthen the university's efforts toward conservation.

In addition, SPIHER's focus on water quality parameters such as pH, TDS, salinity, turbidity, and dissolved oxygen reflects its commitment not only to conserving water but also to ensuring that available water meets essential health, safety, and environmental standards. Overall, the university's integrated approach combining behavioural awareness, technological interventions, and scientific monitoring positions SPIHER as a responsible and sustainability-focused institution dedicated to safeguarding water resources for both present and future generations