TSUULL Water Conservation Program

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INTRODUCTION

Why we need to conserve water?

The most valuable resource is water which help maintain the life.

However, given the reckless use of fresh water and the growing shortage of it, population increase and climate change, it is critically necessary to utilize water wisely and implement conservation measures.

First, It is essential to comprehend how water is used in educational buildings and compare this consumption to standards in order to sustain this priceless resource. This would allow the industry to recognize the potential for saving water and assist in developing successful plans to do so.

Freshwater resources have long been considered an infinite resource, heavily reliant on the capacity for regeneration provided by the water cycle that occurs naturally.

Our world has a finite amount of water, 97.5% of which is salty found in the oceans and only 2.5% of which is freshwater. The majority of this freshwater is underground or inaccessible in the form of ice in the Polar Regions and mountains. Ecosystems and people can only use 0.01% of the water on Earth.

Why water conservation in education important?

- Environmental protection: Reducing reliance on the public water system can ease the burden on a resource that is becoming increasingly scarce.
- Upcoming legislation: The administration is now considering its strategy for establishing water usage goals. It won't be long before laws that must be followed are implemented.
- HEI have a responsibility to the community and can set an example by doing so.
- Lower water bills: HEI buildings with efficient water consumption will have lower water bills.

WATER CONSERVATION

Effective Plumbing Layout:

By implementing easy and affordable water-saving strategies, such as installing water-efficient fixtures, fittings, and appliances, water use can be dramatically reduced over the long run.

Water conservation should be encouraged in TSUULL campus buildings by using efficient plumbing design.

- Bathrooms, kitchens, and other 'wet zones' should be strategically situated close to one another to reduce the need for extra pipework and freshwater transportation.
- Effective hydraulic calculations encourage the proper sizing of plumbing fixtures and pipework for a structure, preventing the needless use of more water.
- To guarantee optimum efficiency, all plumbing systems should receive routine maintenance and be leak-free at all times.

WATER EFFICIENT APPLIANCES AND FIXTURES

The quantity of water used in TSUULL building can be significantly decreased by specifying low-volume or waterless faucets and fixtures. These consist of:

01

Water Meters

In contrast to anticipated main water bills, installing water meters provides a direct indicator of the amount of water consumed. It is also possible to assign the precise cost of water consumed to certain structures or divisions, holding them responsible for their consumption. Additionally, it can support conservation measures that encourage residents to reduce consumption through regular behavior. Water meters also make it simpler to spot consumption anomalies and can support the detection of building leaks.

02

Water Taps

Low flow taps can use up to 50% less water than standard taps. When compared to ordinary taps, automatic closure faucets may lower consumption by further 20%. Infrared sensors used in electronic taps allow them to automatically control water release, potentially saving 40% more water than conventional taps.

03

Low-flow toilets

The average toilet needs 13.5 liters of water per flush. Since flushing urinals consumes the majority of water in non-domestic buildings, it's crucial to utilize efficient fixtures. Low-flush toilets use a 6 liter tank instead of regular ones. When compared to normal WCs, this can result in overall savings of between 40 and 50 percent. Additionally, there are extremely low-flush toilets with enhanced bowl designs that make cleaning easier and utilize only 3 liters of water per flush available. It is also possible to install dual flush valves on toilets, which apply a 4.5 litre flush volume for solid waste and a lesser 2.2 litre flush volume for liquid waste.

WATER SUPPLY-RAINWATER HARVESTING

A rainwater harvesting system

Rainwater harvesting systems collect rain from the ground or building roofs and filter the runoff before storing it for later use rather than letting it wash away. Rainwater harvesting is a straightforward idea that encourages independence by minimizing reliance on municipal fresh water supplies.

What can be done with the rainwater collected?

The usage of the water that has been obtained depends on how it has been treated.

Untreated Rainwater	Filtered Rainwater Use	Potable Rainwater Use
Untreated rainwater should only be used where there is no risk of bacterial contamination, such as for garden irrigation, other exterior purposes like floor washing, or water decorations like fountains.	If rainwater is going to be used internally, such as for washing machines or toilet flushing, it needs to be filtered to get rid of dirt, organic matter like leaves and sticks, and maybe other suspended stuff like dust and earth. Following filtering, the collected rainwater is put in a tank where it can be used.	A high grade of water quality is required for consumption by government standards. Processes like micro-filtration and disinfection are required for usable uses of rainwater, such as cooking and drinking. A fail-safe device that would instantly stop the supply in the event of any equipment failure or if the required water quality is not achieved is also essential.

Waste Water Recycling

Grey water and black water (the water from toilets) together make up waste water, also known as sewage. Reedbeds are a popular way to recycle waste water. Reedbeds are man-made wetlands with reed plants that offer the perfect environment for the growth of microorganisms that can support aerobic sewage treatment.

How is waste water recycled?

Compared to traditional treatment methods, reed beds are inexpensive and low-maintenance solutions that frequently operate without the use of mechanical or electrical equipment. However, they need a certain amount of space for the treatment process, hence reed beds are most often used on large building sites.

The type of reed bed, which can be horizontal, vertical, or a combination of the two, is mostly determined by the physical terrain present on site and the potential flow of wastewater.

Although these require a substantial treatment footprint, medium and strongly contaminated wastewaters can be treated in ponds, lakes, and other aquatic wetlands.

ASSESSING WATER CONSUMPTION

By measuring the water that enters the building and the water that exits as sewage and runoff, a water audit may be used to determine the college's annual water usage.

Estimating demand

The annual water demand may be estimated through the following equation:

$$\text{Annual Demand } (m^3) = \frac{\text{Av. Consumption per Capita x No. of people x No. of working days}}{1000}$$

Pre-audit

Prior to conducting a water audit, it is crucial to determine its scope and time frame. Depending on how in-depth the audit is, audits should ideally be planned on a daily, weekly, monthly, or even annual basis. In order to establish the audit scope, it is crucial to identify and quantify all water-consuming appliances and fixtures of the building (or buildings) at hand.

Audit

A water audit can be carried out with the help of one or more of the following techniques, depending upon the audit scope and specific requirements: Metering, Data-logging, Survay, Diary-Tracking

ROLE OF SUSTAINABLE PRACTICES OFFICE

TSUULL Sustainable Practices Office plays a pivotal role in conserving water and ensuring water efficiency standards. Regular water auditing to measure consumption and reporting and dissemination of such results to create awareness amongst users are essential for any effective water management strategy.

Efficient management systems during operation and maintenance	• Periodic water audits to ensure water efficiency standards are met. • Reporting results from water audits to publicise savings in water quantities and cost achieved. This not only helps to increase awareness but also substantiates the need for conducting regular audits.
Dissemination of information amongst staff and students	• Educating occupiers by promoting public awareness of issues related to water resources. • Water-saving campaigns can help to convince users to reduce water consumption through simple changes in behaviour. • Informative posters or stickers placed near points of water use, can provide a constant reminder to users for modifying wasteful attitudes into reductive behaviour.

Local water provider for TSUULL might be able to offer thorough water auditing services, including leak identification utilizing a variety of methods and equipment, depending on the scope of the audit. A water audit can also be performed by a number of privately held businesses.

The length of the audit, the amount of equipment needed, and the size of the college all influence the time and money involved.

ACKNOWLEDGEMENTS

TSUULL Sustainable Practices Office has established the Water Conservation Program under the provision of the Resctor and will effectively be implementing the Program considering it fundamental in establishing the sustainable campuses.

TSUULL thanks all for your continued support in our efforts to contribute to the SDGs.

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