

Assessing the Reuse Potential of Water Collected from the Air Conditioning Units of East West University: A Pilot Study on Air Condensate Harvesting

Abstract

Air conditioning system (AC) provides us with fresh air along with water by product which normally be known as air condensate. Air conditioning condensate produced from the air conditioning unit is considered wastewater which is being typically discharged in sewer lines or drains. East West University (EWU) houses more than 700 AC units which is a significant source of air condensate apart from cooled air. Such large air conditioning process also requires a significant amount of water supplied by DWASA for cooling purposes. But we have very limited knowledge about the air condensate, on its usable quantity and quality for different water uses across various institutional and commercial premises. Therefore, it can be a valuable yet underutilized resource which can be sustainably used to reduce WASA water demands if this resource has been used as an alternative coolant. The adoption of harvested air condensate is hindered by a lack of comprehensive data regarding its quality, quantity, and practical applications.

This study aims to bridge this knowledge gap by assessing the viability of air condensate collection and utilization at EWU. The university, with its diverse building types, varied microclimates, and commitment to sustainable campus, serves as an ideal setting for this investigation. Through data collection, experimental analysis, and comparative evaluations, the study aims to provide a practical framework for implementing air condensate harvesting systems. Using air condensate could also reduce water purchase costs, conserve valuable freshwater resources when it can be used for other water demands. The findings are expected to demonstrate the potential of air condensate as a sustainable water source, not only for EWU but also for similar institutions, commercial facilities, and areas, contributing to energy conservation and cost minimization. By establishing the feasibility of air condensate harvesting and utilization, this study aligns with EWU's sustainability goals and contributes to global efforts in resource conservation and environmental leadership.