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Preliminary Analysis of Air Conditioner Condensate Water Generation in Buttala, Monaragala, Sri Lanka

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Abstract

In tropical countries like Sri Lanka, a significant amount of air-conditioner (A/C) condensate water is often discharged into the environment without being utilized. Although considerable number of reports available for South and East Asia, research related to AC condensate in Sri Lanka is scanty. The aim of this research was to analyse the quality and quantity of the discharged condensed water after understanding the potential environmental concerns. Monaragala district was chosen for this study due to its dry climate and the widespread use of air conditioners in most shops, resulting in a substantial discharge of condensed water into the environment. Water samples were taken from 31 institutions within Buttala area. These samples were collected in triplicate, and the mean value was used for analysis. When considering all parameter values, pH, TDS, Turbidity, Electrical Conductivity, and color showed good compliance with the SLS 614:2013 and NEA standards. (Mean values were 7.317, 28.37 ppm, 1.47 NTU, 54.21 µS, 10.74 and standard deviation values were 0.1138, 13.46, 0.1961, 26.01, 5.047 respectively). Therefore, the condensed water from air conditioners is unlikely to have environmental impacts and can be safely used for irrigation and agricultural purposes. In the case of potable water, all the parameters analyzed in this research were well-fitted with the potable water standards. However, if it is intended for drinking purposes, further analysis for heavy metal contamination is required. By considering 11 number of A/C units, an amount of condensed water 0.97L/h/ton is released to the environment; equivalent to approximately 7.76 L/ton per day. The values were taken in duplicates. The volume of condensate water, while considerable, doesn't need to be released into the environment without purpose. Instead, this water can be efficiently utilized for various applications, including garden irrigation, toilet flushing, cooling applications, cleaning, fire suppression, and construction. This suggestion is imperative, not only for the Buttala area but for the entire country of Sri Lanka, as this approach can yield several positive effects on both the environment and the economy.

***Keywords**:* Air conditioners, Condensed water, Quality analysis, Quantity analysis