Feasibility and sustainability of evaporation ponds as final basins for industrial wastewater: statistical evaluation of gross parameters

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ABSTRACT

Many industrial sites use evaporation ponds as their final discharge location for wastewater. Many environmental impacts and aspect studies have recommended this type of solution to avoid industrial wastewater discharge into superficial water to avoid water pollution. However, this solution may pose a serious environmental and ecological issue. Based on a practical study for an industrial site located in the Eastern Region of Morocco that used evaporation ponds for its wastewater, we assessed the evolution of wastewater physico-chemical parameters between the evaporation ponds and the effluent system (wastewater before discharge into evaporation pond) for a period of one year. The results of a study of wastewater stored in evaporation ponds to see how evaporation affects industrial effluent show a significant increase in physico-chemical parameters. As a result, there will be an increase in water contamination. The strongly correlated and interrelated wastewater parameters in the evaporation pond were identified using correlation coefficients. For highly linked wastewater characteristics, regression models linking these identified and correlated parameters were developed. This water pollution poses a significant environmental concern in the case of an unintended leak, and it might have a significant impact on biodiversity because the water draws a wide range of bird and animal species. In certain cases, wastewater reuse/recycling is offered as a control mechanism to reduce potential environmental and ecological risks.

Keywords: Evaporation ponds; Environment; Wastewater; Physico-chemical parameters; Correlation and regression analysis