

ABSTRACT

Chance-constrained Probabilistic-fuzzy Programming Approach for Optimization of Domestic Wastewater Treatment in Facultative Pond

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Domestic wastewater treatment is carried out to improve the quality of wastewater so that it does not pollute the environment after the treatment process. Optimization of pond performance is carried out with the aim that the volume of processed wastewater can produce a BOD value that meets the quality standard. This study uses a fuzzy probabilistic programming approach model with chance-constrained constraints that combine probabilistic uncertainty in the BOD value and fuzzy uncertainty in the volume of processed wastewater. This study successfully constructed a fuzzy probabilistic chance-constrained programming optimization model in optimizing domestic wastewater treatment for the Sewon Wastewater Treatment Plant (WWTP). Simulation results show that this optimization model can minimize the BOD concentration by maximizing the volume of treated wastewater, so that the BOD meets the quality standard. This research can be considered as a supporter in sustainable WWTP management.

Keywords: *pond performance, BOD, wastewater volume, WWTP.*