

## عنوان مقاله:

Effects of some functional parameters on do deficit in a natural stream

## محل انتشار:

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## خلاصه مقاله:

The effects of variation of stream velocity, distance, ultimate biological oxygen demand BOD, on initial dissolved oxygen DO and optimum dissolved oxygen DO deficit, in Amadi creek was studied Amadi creek, located in Port-Harcourt metropolis is a unique CREEK that is of high economic importance to the residents of Rumuobiakani, Mini-Ewa, Oginigba, Woji and Okujagu communities as it hosts the activities of the majority of the companies around the Trans- Amadi Industrial area and also provides water for fishing and water transportation The study was carried out to evaluate the water quality changes resulting from increasing human and industrial activities in and around the creek A point-source waste water discharge with flow rate (Q), biological oxygen demand BOD and dissolved oxygen demand (DO), of 0.000018m<sup>3</sup>/s, 1000mg/l, and mg4.1 formed the first case The other case contained an additional point source with flow rate (Q), biological oxygen demand (BOD), and dissolved oxygen demand (DO) of 0.000035m<sup>3</sup>/s, 500mg/l and 4mg/l respectively The study of the DO resources of the stream was undertaken with the aim of providing concepts which can be of assistance to regulatory agencies responsible for making decisions for water quality management The DO deficit equations are solved by the methods of simple calculus (classical optimization), which simplifies the mathematical solution of the model equations by avoiding difficult to evaluate integrals Two scenarios were identified and used to investigate the effect of BOD on the DO level in the stream, using mathematical simulation techniques Simulation results of the two scenarios suggest that the dissolved oxygen DO deficit is depends mainly on the distance between waste discharge points Hence to ensure minimum impact on water quality waste discharge locations should be placed at the optimal locations of mand !! m upstream and downstream waste discharge points respectively, at an optimal DO deficit of mg/l for the first scenario, and at m, !! m, !m upstream and downstream waste discharge points respectively for the second scenario at an optimal DO deficit of mg/l A characteristic DO curve shows the DO deficit increasing as the BOD in the waste water is being degraded, while the DO deficit decreases as the BOD consumption rate becomes smaller than the reaeration rate, as the waste stream flows downstream Generally as stream velocity increases, the reaeration coefficient increases, resulting in an increased rate of oxygen transfer between water and the atmosphere, and hence an increase in the DO deficit initially, ... followed by a gradual decrease further

## کلمات کلیدی:

Simulation/Amadi creek/Optimization/Waste discharge point water quality/Deficit

## لینک ثابت مقاله در پایگاه سیویلیکا:

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